

**JP-15X ELECTRONIC TYPEWRITER  
SERVICE MANUAL & PARTS REFERENCE LIST**

**MECHANICAL PORTION**

**brother®**

**MODEL; EM-250**







# **PARTS REFERENCE LIST**

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## — PREFACE —

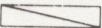
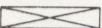
This Parts Reference List (MECHANICAL PORTION) pertains to the "Electronic Office Typewriter JP-15X" and the data of each models in reference to the Supply Parts which have been accumulated since the data (Oct. 1984).

In order to accomplish the After-Service most efficiently, it is most essential to sufficiently grasp the general explanation of Parts Reference List (MECHANICAL PORTION & ELECTRIC PORTION) usage and the ordering Procedures described on each items.



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## 1. VIEWPOINT OF PARTS REFERENCE LIST & COMPOSING UNITS

This Parts Catalog describes by coordinating the Electronic Office Typewriter JP-15X series.

The composing units of the disassembly drawing have been divided in accordance to their functions in group order as; Printing Element, Cover & Circuit Board and etc.

Upon usage, compare the Model Number indicated at the top of the Index as per the models within the product Model Numbers and Parts Reference List and clarify the Main-Reference Number of each model unit then, procure the required part from the disassembly drawing within that Main-Reference Number.

## 2. REFERENCE NUMBERS

The reference numbers consist of the Main-Reference Number and the Sub-Reference Number.

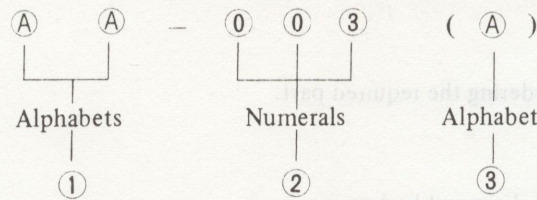
The functions of each are as follows:

### a) Main-Reference Number

This serves the objective in joining the model functional disassembly drawing.

(Indication)

The Main-Reference Number is indicated with five or six figures per functional disassembly drawing.



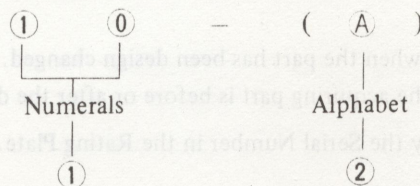
Definition of indicating items

| No. | Definition                                    |
|-----|-----------------------------------------------|
| ①   | Series & model classification                 |
| ②   | Functional disassembly drawing classification |
| ③   | Disassembly drawing detail classification     |

### b) Sub-Reference Number

This serves the objective in joining the functional disassembly drawing and Parts Code and Parts Name.

The Sub-Reference Number is indicated with one figure to three figures.



Definition of indicating items

| No. | Definition                              |
|-----|-----------------------------------------|
| ①   | Disassembly drawing consecutive numbers |
| ②   | Design change occurrence classification |



## 3. INDICATION DETAILS OF PARTS CODE &amp; PARTS NAME

|               |        |                       |  |  |        |        |          |                 |       |        |
|---------------|--------|-----------------------|--|--|--------|--------|----------|-----------------|-------|--------|
| ①<br>↓        |        | ②<br>↓                |  |  |        |        |          |                 |       |        |
| MAIN-REF. NO. |        | Functional group name |  |  |        |        |          |                 |       |        |
| SUB-REF. NO.  | CODE   | NAME                  |  |  | Q'TY   | C/P    | NEW CODE | PRODUCTION FROM | UP TO | REMARK |
| ③<br>↑        | ④<br>↑ | ⑤<br>↑                |  |  | ⑥<br>↑ | ⑦<br>↑ | ⑧<br>↑   | ⑨<br>↑          |       |        |

- 1 Main-Reference Number  
This number joins the model and functional disassembly drawing.
- 2 Functional Classification name
- 3 Sub-Reference Number  
This number joins the functional disassembly drawing and Parts Code and Parts Name.
- 4 Parts Code  
This number is utilized for ordering the required part.
- 5 Parts Name  
The Parts Name relates to the disassembly drawing.
- 6 Quantity (Q'ty)  
This indicates the utilizing quantity in relation to the Parts Name of 5.  
Even with the same Parts Code within the same page, it is separately mentioned every time when the Parts Name of 5 differs.
- 7 C/P  
When it is mentioned in this column, it indicates that this part has been design changed.  
It indicates the replacement of the mentioning figure difference. (For detail, please refer to the replacement item (design change part).
- 8 New Code  
This indicates the New Code of the replacement item (design change part).
- 9 Production  
This indicates the manufacturing period when the part has been design changed.  
(This material helps in judging whether the acquiring part is before or after the design change.)  
Caution : The production is indicated by the Serial Number in the Rating Plate.

## PRODUCTION

| FROM     | UP TO    |
|----------|----------|
| A4000010 | C5011000 |



#### 4. PARTS REPLACEMENT (DESIGN CHANGED PARTS)

When a part is design changed, there is a change with interchangeability and a change without the interchangeability.

Among these, the change which is capable to utilize the new part even on the old product is called "Parts Replacement"

In order to accomplish the After-Service most efficiently, it is most essential to adapt this replacement effectively.

##### a) Definition of C/P column code

| Code | Term                 | Definition                                                                                                                                        |
|------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| A    | Unit replacement     | Replacement capable only with unit part                                                                                                           |
| B    | Assembly replacement | Replacement capable with part SET                                                                                                                 |
| C    | Special replacement  | It relates to special replacement when the assembled quantity is numerous with assembly replacement. In this case, attach sheet will be enclosed. |
| D    | Discontinued parts   |                                                                                                                                                   |

##### b) Viewpoint of replacement

[Unit replacement]

#### PARTS CODE & PARTS NAME

| MAIN-REF. NO. | PA-061    | Functional group name | COVER |     |              |                       |          |        |
|---------------|-----------|-----------------------|-------|-----|--------------|-----------------------|----------|--------|
| SUB-REF. NO.  | CODE      | NAME                  | Q'TY  | C/P | NEW CODE     | PRODUCTION FROM UP TO |          | REMARK |
|               | 507662001 | Spring                | 1     | A   | 535099001(1) | A4000010              | C5011000 |        |

The Parts Code 507662001 has been revised to New Code 535099001 and the C/P is (A), it is a unit replacement. The old part production is from Serial Number A4000010 up to C5011000.

Caution : The figure within the ( ) at the side of the New Code is the quantity of New Part requirement per piece of Old Part.

[Assembly replacement]

#### PARTS CODE & PARTS NAME

| MAIN-REF. NO. | KA-061(A) | Functional group name | MAIN COVER |     |                                                              |                       |          |        |
|---------------|-----------|-----------------------|------------|-----|--------------------------------------------------------------|-----------------------|----------|--------|
| SUB-REF. NO.  | CODE      | NAME                  | Q'TY       | C/P | NEW CODE                                                     | PRODUCTION FROM UP TO |          | REMARK |
| 10            | 518096001 | Opener Spring         | 1          | B   | 518206001(1)<br>518207001(1)<br>518155001(1)<br>518174001(1) | A7000010              | D8011000 |        |

The Parts Code 518096001 has been revised to New Code 518206001 and as the C/P is (B), it is an assembly replacement. The old part production is from Serial Number A7000010 up to D8011000.

Caution : The figure within the ( ) at the side of the New Code is the quantity of New Part requirement per piece of Old Part.



5. ORDERING PROCEDURES

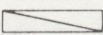
The ordering person is capable to perform the specified various procedures of the Parts Code, Parts Name and utilizing locations when ordering the required parts but, due to the knowledge of the ordering person and order receiving person, it may be difficult to convey the contents correctly.  
To compensate for the misunderstanding of these persons and to request the correct parts, it is very important to sufficiently grasp the following precautions of the ordering procedures.

a) Ordering procedure of Common Parts

The following describes the definite communication and indicating items.

|              |            |                         |                                   |          |
|--------------|------------|-------------------------|-----------------------------------|----------|
| Model Number | Parts Code | Parts Name              | Reference Numbers<br>(Main & sub) | Quantity |
| EM-250       | 575016001  | Correction Spool Holder | TF-017-13                         | 10 pcs.  |

b) Ordering procedure of  Color Part

The code column  Part differs with the color.

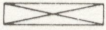
The Parts Code and Parts Name are separately indicated in the lower space as Special Parts.

Please refer to this and order by matching the required color.

The following describes the definite communication and indicating items.

|                              |            |                  |                                   |          |
|------------------------------|------------|------------------|-----------------------------------|----------|
| Model Number<br>(Parts Code) | Parts Name | Color            | Reference Numbers<br>(Main & sub) | Quantity |
| EM-250                       | 575203001  | Upper Cover Unit | TF-061-9                          | 5 pcs.   |

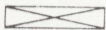


- c)  ordering procedure of parts for different territories.

The code column  part indicates the part utilized by different territories.

The Parts Code and Parts Name are separately indicated in the lower space as Special Parts.

Please order the required parts by referring to the disassembly drawing and Special Parts.

- (\*) The code column  part is CIRCUIT BOARD ASSEMBLY, PRINTING ELEMENT, COVER, NAME PLATE, INSTRUCTION BOOK, RATING PLATE, CARTON.

- d) Ordering procedure of Electrical Parts

The Electrical Parts differ in accordance to the utilizing electrical standards of the territory.

The disassembly drawings are drawn separately to match the electrical standards of each territory.

Upon ordering, please refer to the disassembly drawing upper space for separate standards of each territory.

The following described the definite communication and indicating items.

Model Number

Parts Code

Parts Name

Electrical Standards

Reference Numbers  
(Main & sub)

Quantity

[Indication example]

| Model No. | Parts Code | Parts Name                    | Electrical Standards | Reference Nos.<br>(Main & sub) | Quantity |
|-----------|------------|-------------------------------|----------------------|--------------------------------|----------|
| EM-250    | 575638001  | Filter Circuit Board Assembly | 200~240V             | TF-050-1                       | 2 pcs.   |



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## KEY TOP

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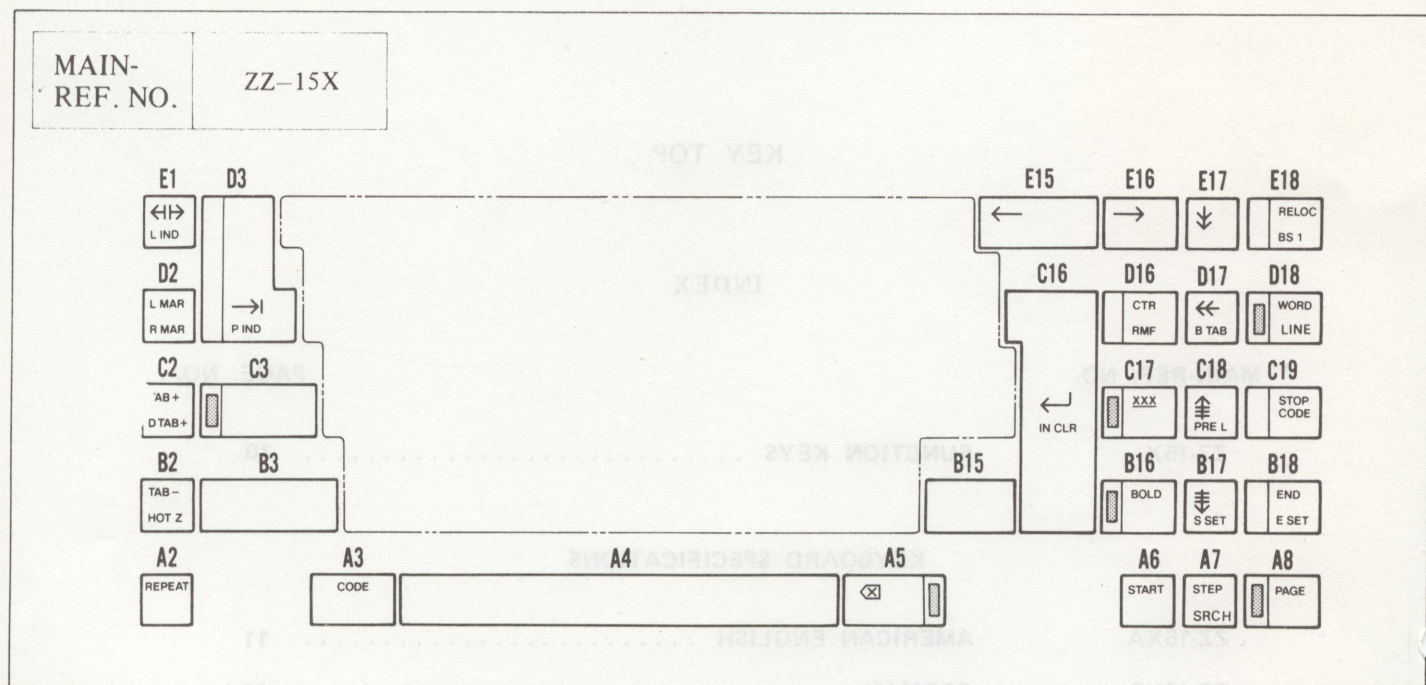
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## KEY TOP (FUNCTION KEYS)



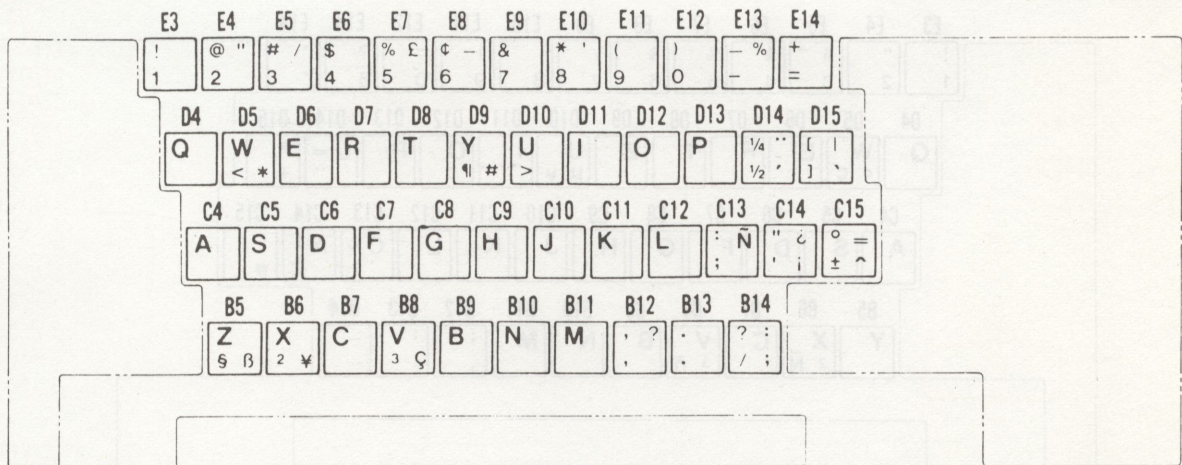
| SUB-REF. NO. | CODE      | NAME                              | Q'TY | SUB-REF. NO. | CODE      | NAME                            | Q'TY |
|--------------|-----------|-----------------------------------|------|--------------|-----------|---------------------------------|------|
| A2           | 583337001 | Repeat Key                        | 1    | E1           | 583305001 | Margin Release, Line Indent Key | 1    |
| A3           | U50482001 | Code Key                          | 1    | E15          | U50474001 | Back Space Key                  | 1    |
| A4           | U50483001 | Space Bar                         | 1    | E16          | U50475001 | Forward Space Key               | 1    |
| A5           | U50484001 | Correction Key                    | 1    | E17          | U50473001 | Automatic Paper Set Key         | 1    |
| A6           | 583338001 | Start Key                         | 1    | E18          | U50476001 | Relocation, Back Space 1 Key    | 1    |
| A7           | U51535001 | Step, Search Key                  | 1    |              |           |                                 |      |
| A8           | 583340001 | Page Key                          | 1    |              |           |                                 |      |
| B2           | 583327001 | Tab Clear, Hot Z Set Key          | 1    |              |           |                                 |      |
| B3           | U50480001 | Shift Key (Left)                  | 1    |              |           |                                 |      |
| B15          | U50481001 | Shift Key (Right)                 | 1    |              |           |                                 |      |
| B16          | 583334001 | Bold Key                          | 1    |              |           |                                 |      |
| B17          | 583335001 | Sub Script, Start Set Key         | 1    |              |           |                                 |      |
| B18          | 583336001 | End, End Set Key                  | 1    |              |           |                                 |      |
| C2           | 583320001 | Tab Set, Decimal Tab Set Key      | 1    |              |           |                                 |      |
| C3           | U50478001 | Shift Lock Key                    | 1    |              |           |                                 |      |
| C16          | U50479001 | Return, Indent Clear Key          | 1    |              |           |                                 |      |
| C17          | 583324001 | Auto Underlining Key              | 1    |              |           |                                 |      |
| C18          | 583325001 | Super Script, Pre Line Key        | 1    |              |           |                                 |      |
| C19          | 583326001 | Stop Code Key                     | 1    |              |           |                                 |      |
| D2           | 583312001 | Left, Right, Margin Set Key       | 1    |              |           |                                 |      |
| D3           | U50477001 | Tab, Paragraph Indent Key         | 1    |              |           |                                 |      |
| D16          | 583318001 | Centering, Right Margin Flash Key | 1    |              |           |                                 |      |
| D17          | 583319001 | Express Back Space, Back Tab Key  | 1    |              |           |                                 |      |
| D18          | U51534001 | Word, Line Key                    | 1    |              |           |                                 |      |



## KEY TOP (AMERICAN ENGLISH)

MAIN-  
REF. NO.

ZZ-15XA



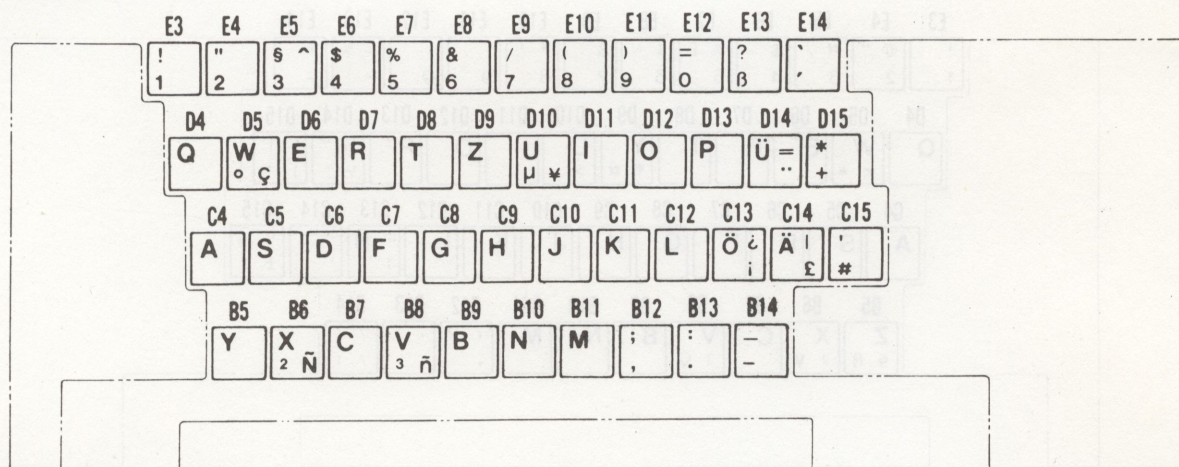
| SUB-REF. NO.    | CODE      | NAME                     | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|-----------------|-----------|--------------------------|------|--------------|-----------|---------------|------|
| B5 <sup>4</sup> | 583328001 | Key ( Z § β )            | 1    | E3           | U50429001 | Key ( ! 1 )   | 1    |
| B6              | 583329001 | Key ( X <sup>2</sup> ¥ ) | 1    | E4           | 583306001 | Key ( @ 2 " ) | 1    |
| B7              | 583290001 | Key ( C )                | 1    | E5           | 583307001 | Key ( # 3 / ) | 1    |
| B8              | 583330001 | Key ( V <sup>3</sup> ç ) | 1    | E6           | 583241001 | Key ( \$ 4 )  | 1    |
| B9              | 583292001 | Key ( B )                | 1    | E7           | 583308001 | Key ( % 5 £ ) | 1    |
| B10             | 583293001 | Key ( N )                | 1    | E8           | 583309001 | Key ( ¢ 6 - ) | 1    |
| B11             | 583294001 | Key ( M )                | 1    | E9           | 583244001 | Key ( & 7 )   | 1    |
| B12             | 583331001 | Key ( , , ? )            | 1    | E10          | 583310001 | Key ( * 8 ' ) | 1    |
| B13             | 583332001 | Key ( . . )              | 1    | E11          | 583246001 | Key ( ( 9 )   | 1    |
| B14             | 583333001 | Key ( ? / : ; )          | 1    | E12          | 583247001 | Key ( ) 0 )   | 1    |
| C4              | 583273001 | Key ( A )                | 1    | E13          | 583311001 | Key ( - - % ) | 1    |
| C5              | 583274001 | Key ( S )                | 1    | E14          | 583249001 | Key ( + = )   | 1    |
| C6              | 583275001 | Key ( D )                | 1    |              |           |               |      |
| C7              | 583276001 | Key ( F )                | 1    |              |           |               |      |
| C8              | 583277001 | Key ( G )                | 1    |              |           |               |      |
| C9              | 583278001 | Key ( H )                | 1    |              |           |               |      |
| C10             | 583279001 | Key ( J )                | 1    |              |           |               |      |
| C11             | 583280001 | Key ( K )                | 1    |              |           |               |      |
| C12             | 583281001 | Key ( L )                | 1    |              |           |               |      |
| C13             | 583321001 | Key ( : ; Ñ )            | 1    |              |           |               |      |
| C14             | 583322001 | Key ( " ' ; )            | 1    |              |           |               |      |
| C15             | 583323001 | Key ( ° ± = ^ )          | 1    |              |           |               |      |
| D4              | U50431001 | Key ( Q )                | 1    |              |           |               |      |
| D5              | 583313001 | Key ( W < * )            | 1    |              |           |               |      |
| D6              | 583259001 | Key ( E )                | 1    |              |           |               |      |
| D7              | 583260001 | Key ( R )                | 1    |              |           |               |      |
| D8              | 583261001 | Key ( T )                | 1    |              |           |               |      |
| D9              | 583314001 | Key ( Y ¶ # )            | 1    |              |           |               |      |
| D10             | 583315001 | Key ( U > )              | 1    |              |           |               |      |
| D11             | 583264001 | Key ( I )                | 1    |              |           |               |      |
| D12             | 583265001 | Key ( O )                | 1    |              |           |               |      |
| D13             | 583266001 | Key ( P )                | 1    |              |           |               |      |
| D14             | 583316001 | Key ( 1/4 1/2 " ' )      | 1    |              |           |               |      |
| D15             | 583317001 | Key ( [ ]   ` )          | 1    |              |           |               |      |



## KEY TOP (GERMAN)

MAIN-  
REF. NO.

ZZ-15XB



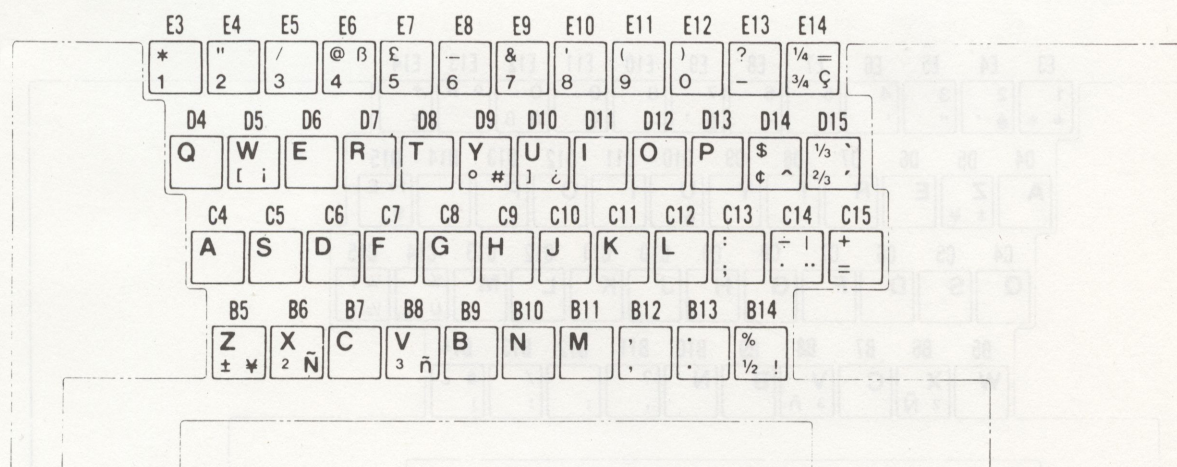
| SUB-REF. NO. | CODE      | NAME            | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|-----------------|------|--------------|-----------|---------------|------|
| B5           | 583358001 | Key (Y)         | 1    | E3           | U50429001 | Key ( ! 1 )   | 1    |
| B6           | 583359001 | Key ( X ² Ñ )   | 1    | E4           | 583341001 | Key ( " 2 )   | 1    |
| B7           | 583290001 | Key (C)         | 1    | E5           | 583342001 | Key ( § 3 ^ ) | 1    |
| B8           | 583360001 | Key ( V ³ ñ )   | 1    | E6           | 583241001 | Key ( \$ 4 )  | 1    |
| B9           | 583292001 | Key (B)         | 1    | E7           | 583242001 | Key ( % 5 )   | 1    |
| B10          | 583293001 | Key (N)         | 1    | E8           | 583343001 | Key ( & 6 )   | 1    |
| B11          | 583294001 | Key (M)         | 1    | E9           | 583344001 | Key ( / 7 )   | 1    |
| B12          | 583361001 | Key ( ; , )     | 1    | E10          | 583345001 | Key ( ( 8 )   | 1    |
| B13          | 583362001 | Key ( : . )     | 1    | E11          | 583346001 | Key ( ) 9 )   | 1    |
| B14          | 583363001 | Key ( _ - )     | 1    | E12          | 583347001 | Key ( = 0 )   | 1    |
| C4           | 583273001 | Key (A)         | 1    | E13          | 583348001 | Key ( ? ß )   | 1    |
| C5           | 583274001 | Key (S)         | 1    | E14          | 583349001 | Key ( ' # )   | 1    |
| C6           | 583275001 | Key (D)         | 1    |              |           |               |      |
| C7           | 583276001 | Key (F)         | 1    |              |           |               |      |
| C8           | 583277001 | Key (G)         | 1    |              |           |               |      |
| C9           | 583278001 | Key (H)         | 1    |              |           |               |      |
| C10          | 583279001 | Key (J)         | 1    |              |           |               |      |
| C11          | 583280001 | Key (K)         | 1    |              |           |               |      |
| C12          | 583281001 | Key (L)         | 1    |              |           |               |      |
| C13          | 583355001 | Key ( Ö ö ; )   | 1    |              |           |               |      |
| C14          | 583356001 | Key ( Ä ä   £ ) | Φ    |              |           |               |      |
| C15          | 583357001 | Key ( ' # )     | 1    |              |           |               |      |
| D4           | U50431001 | Key (Q)         | 1    |              |           |               |      |
| D5           | 583350001 | Key ( W ° ¸ )   | 1    |              |           |               |      |
| D6           | 583259001 | Key (E)         | 1    |              |           |               |      |
| D7           | 583260001 | Key (R)         | 1    |              |           |               |      |
| D8           | 583261001 | Key (T)         | 1    |              |           |               |      |
| D9           | 583351001 | Key (Z)         | 1    |              |           |               |      |
| D10          | 583352001 | Key ( U µ ¥ )   | 1    |              |           |               |      |
| D11          | 583264001 | Key (I)         | 1    |              |           |               |      |
| D12          | 583265001 | Key (O)         | 1    |              |           |               |      |
| D13          | 583266001 | Key (P)         | 1    |              |           |               |      |
| D14          | 583353001 | Key ( Ü = " )   | 1    |              |           |               |      |
| D15          | 583354001 | Key ( * + )     | 1    |              |           |               |      |



## KEY TOP (KING'S ENGLISH)

MAIN-  
REF. NO.

ZZ-15XC



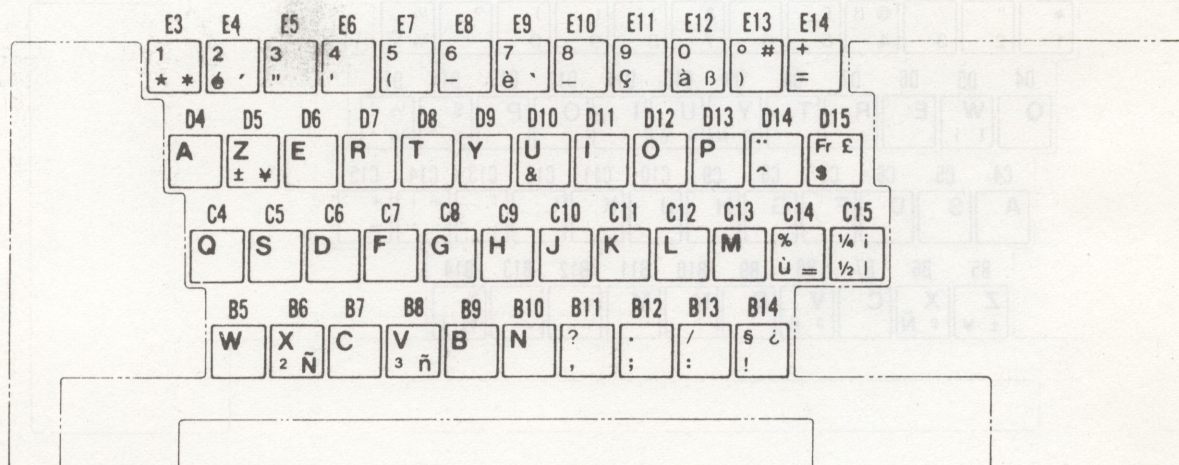
| SUB-REF. NO. | CODE      | NAME                | Q'TY | SUB-REF. NO. | CODE      | NAME            | Q'TY |
|--------------|-----------|---------------------|------|--------------|-----------|-----------------|------|
| B5           | 583616001 | Key ( Z ± ¼ )       | 1    | E3           | 583606001 | Key ( * 1 )     | 1    |
| B6           | 583359001 | Key ( X ² Ñ )       | 1    | E4           | 583341001 | Key ( " 2 )     | 1    |
| B7           | 583290001 | Key ( C )           | 1    | E5           | 583598001 | Key ( / 3 )     | 1    |
| B8           | 583360001 | Key ( V ³ ñ )       | 1    | E6           | 583607001 | Key ( @ 4 ß )   | 1    |
| B9           | 583292001 | Key ( B )           | 1    | E7           | 583608001 | Key ( £ 5 )     | 1    |
| B10          | 583293001 | Key ( N )           | 1    | E8           | 583585001 | Key ( - 6 )     | 1    |
| B11          | 583294001 | Key ( M )           | 1    | E9           | 583244001 | Key ( & 7 )     | 1    |
| B12          | 583571001 | Key ( , , )         | 1    | E10          | 583586001 | Key ( ' 8 )     | 1    |
| B13          | 583332001 | Key ( . . )         | 1    | E11          | 583246001 | Key ( ( 9 )     | 1    |
| B14          | 583617001 | Key ( % ½ ! )       | 1    | E12          | 583247001 | Key ( ) 0 )     | 1    |
| C4           | 583273001 | Key ( A )           | 1    | E13          | 583609001 | Key ( ? - )     | 1    |
| C5           | 583274001 | Key ( S )           | 1    | E14          | 583588001 | Key ( ¼ ¾ = ¢ ) | 1    |
| C6           | 583275001 | Key ( D )           | 1    |              |           |                 |      |
| C7           | 583276001 | Key ( F )           | 1    |              |           |                 |      |
| C8           | 583277001 | Key ( G )           | 1    |              |           |                 |      |
| C9           | 583278001 | Key ( H )           | 1    |              |           |                 |      |
| C10          | 583279001 | Key ( J )           | 1    |              |           |                 |      |
| C11          | 583280001 | Key ( K )           | 1    |              |           |                 |      |
| C12          | 583281001 | Key ( L )           | 1    |              |           |                 |      |
| C13          | 583569001 | Key ( : ; )         | 1    |              |           |                 |      |
| C14          | 583614001 | Key ( ÷ · ¹ ¨ )     | 1    |              |           |                 |      |
| C15          | 583615001 | Key ( + = )         | 1    |              |           |                 |      |
| D4           | U50431001 | Key ( Q )           | 1    |              |           |                 |      |
| D5           | 583610001 | Key ( W [ i )       | 1    |              |           |                 |      |
| D6           | 583259001 | Key ( E )           | 1    |              |           |                 |      |
| D7           | 583260001 | Key ( R )           | 1    |              |           |                 |      |
| D8           | 583261001 | Key ( T )           | 1    |              |           |                 |      |
| D9           | 583611001 | Key ( Y ° # )       | 1    |              |           |                 |      |
| D10          | 583578001 | Key ( U ] ¿ )       | 1    |              |           |                 |      |
| D11          | 583264001 | Key ( I )           | 1    |              |           |                 |      |
| D12          | 583265001 | Key ( O )           | 1    |              |           |                 |      |
| D13          | 583266001 | Key ( P )           | 1    |              |           |                 |      |
| D14          | 583612001 | Key ( \$ ¢ ^ )      | 1    |              |           |                 |      |
| D15          | 583613001 | Key ( 1/3 2/3 ` ´ ) | 1    |              |           |                 |      |



## KEY TOP (FRENCH)

MAIN-  
REF. NO.

ZZ-15XD



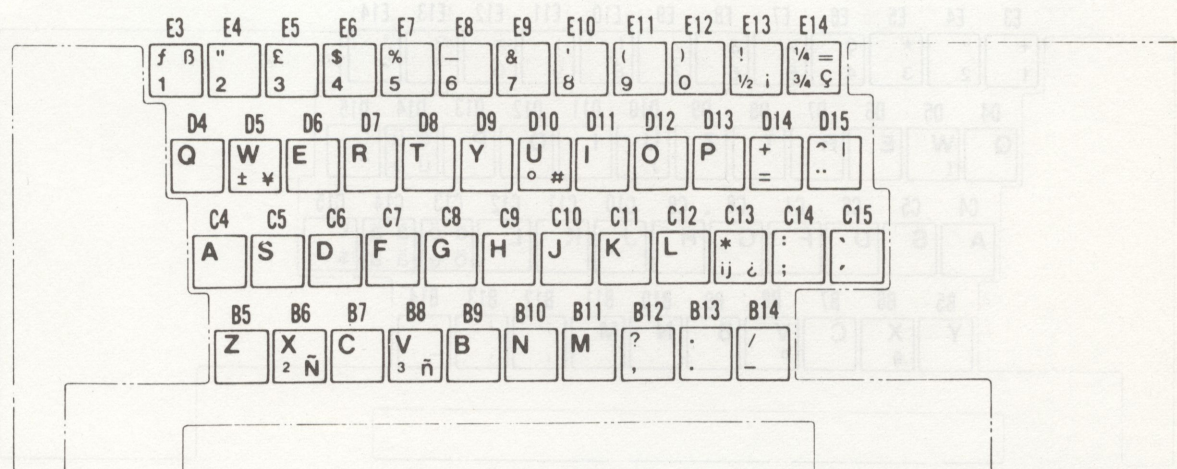
| SUB-REF. NO. | CODE      | NAME                     | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|--------------------------|------|--------------|-----------|---------------|------|
| B5           | 583538001 | Key (W)                  | 1    | E3           | 583517001 | Key ( 1 * * ) | 1    |
| B6           | 583359001 | Key ( X <sup>2</sup> ñ ) | 1    | E4           | 583518001 | Key ( 2 é ´ ) | 1    |
| B7           | 583290001 | Key (C)                  | 1    | E5           | 583519001 | Key ( 3 " )   | 1    |
| B8           | 583360001 | Key ( V <sup>3</sup> ñ ) | 1    | E6           | 583520001 | Key ( 4 ' )   | 1    |
| B9           | 583292001 | Key (B)                  | 1    | E7           | 583521001 | Key ( 5 ( )   | 1    |
| B10          | 583293001 | Key (N)                  | 1    | E8           | 583522001 | Key ( 6 - )   | 1    |
| B11          | 583539001 | Key ( ? , )              | 1    | E9           | 583523001 | Key ( 7 è ` ) | 1    |
| B12          | 583540001 | Key ( . ; )              | 1    | E10          | 583524001 | Key ( 8 - )   | 1    |
| B13          | 583541001 | Key ( / : )              | 1    | E11          | 583525001 | Key ( 9 ç )   | 1    |
| B14          | 583542001 | Key ( § ! ÿ )            | 1    | E12          | 583526001 | Key ( 0 à ß ) | 1    |
| C4           | 583534001 | Key (Q)                  | 1    | E13          | 583527001 | Key ( ° ) # ) | 1    |
| C5           | 583274001 | Key (S)                  | 1    | E14          | 583249001 | Key ( + = )   | 1    |
| C6           | 583275001 | Key (D)                  | 1    |              |           |               |      |
| C7           | 583276001 | Key (F)                  | 1    |              |           |               |      |
| C8           | 583277001 | Key (G)                  | 1    |              |           |               |      |
| C9           | 583278001 | Key (H)                  | 1    |              |           |               |      |
| C10          | 583279001 | Key (J)                  | 1    |              |           |               |      |
| C11          | 583280001 | Key (K)                  | 1    |              |           |               |      |
| C12          | 583281001 | Key (L)                  | 1    |              |           |               |      |
| C13          | 583535001 | Key (M)                  | 1    |              |           |               |      |
| C14          | 583536001 | Key ( % ù = )            | 1    |              |           |               |      |
| C15          | 583537001 | Key ( ¼ ½ ; )            | 1    |              |           |               |      |
| D4           | 583528001 | Key (A)                  | 1    |              |           |               |      |
| D5           | 583529001 | Key ( Z ± ¥ )            | 1    |              |           |               |      |
| D6           | 583259001 | Key (E)                  | 1    |              |           |               |      |
| D7           | 583260001 | Key (R)                  | 1    |              |           |               |      |
| D8           | 583261001 | Key (T)                  | 1    |              |           |               |      |
| D9           | 583530001 | Key (Y)                  | 1    |              |           |               |      |
| D10          | 583531001 | Key ( U & )              | 1    |              |           |               |      |
| D11          | 583264001 | Key (I)                  | 1    |              |           |               |      |
| D12          | 583265001 | Key (O)                  | 1    |              |           |               |      |
| D13          | 583266001 | Key (P)                  | 1    |              |           |               |      |
| D14          | 583532001 | Key ( " ^ )              | 1    |              |           |               |      |
| D15          | 583533001 | Key ( Fr \$ £ )          | 1    |              |           |               |      |



## KEY TOP (DUTCH)

MAIN-  
REF. NO.

ZZ-15XE

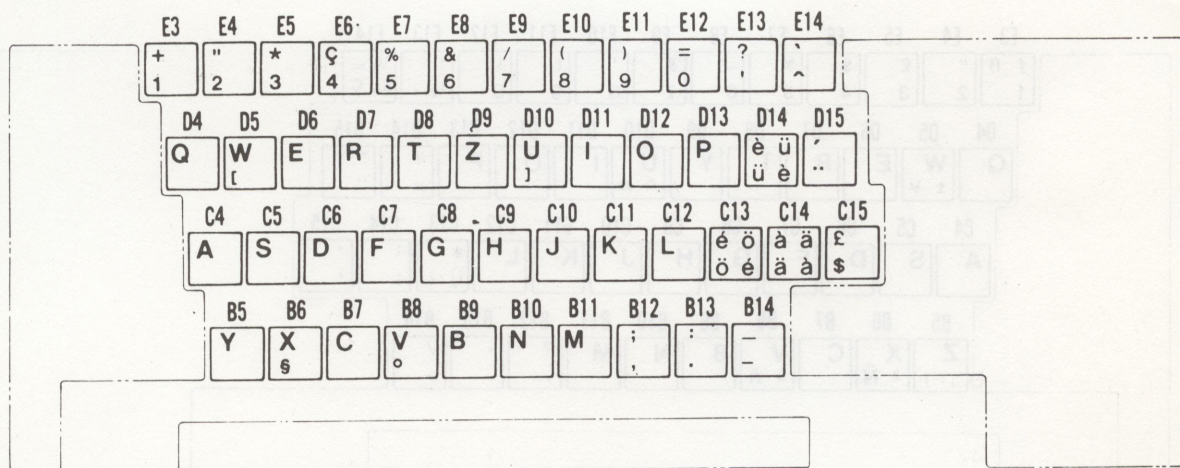


| SUB-REF. NO. | CODE      | NAME           | Q'TY | SUB-REF. NO. | CODE      | NAME            | Q'TY |
|--------------|-----------|----------------|------|--------------|-----------|-----------------|------|
| B5           | 583595001 | Key (Z)        | 1    | E3           | 583583001 | Key ( f β )     | 1    |
| B6           | 583359001 | Key ( X ² ñ )  | 1    | E4           | 583341001 | Key ( " 2 )     | 1    |
| B7           | 583290001 | Key (C)        | 1    | E5           | 583584001 | Key ( £ 3 )     | 1    |
| B8           | 583360001 | Key ( V ³ ñ )  | 1    | E6           | 583241001 | Key ( \$ 4 )    | 1    |
| B9           | 583292001 | Key (B)        | 1    | E7           | 583242001 | Key ( % 5 )     | 1    |
| B10          | 583293001 | Key (N)        | 1    | E8           | 583585001 | Key ( _ 6 )     | 1    |
| B11          | 583294001 | Key (M)        | 1    | E9           | 583244001 | Key ( & 7 )     | 1    |
| B12          | 583539001 | Key ( ? , )    | 1    | E10          | 583586001 | Key ( ' 8 )     | 1    |
| B13          | 583332001 | Key ( . . )    | 1    | E11          | 583246001 | Key ( ( 9 )     | 1    |
| B14          | 583596001 | Key ( / - )    | 1    | E12          | 583247001 | Key ( ) 0 )     | 1    |
| C4           | 583273001 | Key (A)        | 1    | E13          | 583587001 | Key ( ! ½ i )   | 1    |
| C5           | 583274001 | Key (S)        | 1    | E14          | 583588001 | Key ( ¼ ¾ = ¾ ) | 1    |
| C6           | 583275001 | Key (D)        | 1    |              |           |                 |      |
| C7           | 583276001 | Key (F)        | 1    |              |           |                 |      |
| C8           | 583277001 | Key (G)        | 1    |              |           |                 |      |
| C9           | 583278001 | Key (H)        | 1    |              |           |                 |      |
| C10          | 583279001 | Key (J)        | 1    |              |           |                 |      |
| C11          | 583280001 | Key (K)        | 1    |              |           |                 |      |
| C12          | 583281001 | Key (L)        | 1    |              |           |                 |      |
| C13          | 583593001 | Key ( * ij ; ) | 1    |              |           |                 |      |
| C14          | 583569001 | Key ( : ; )    | 1    |              |           |                 |      |
| C15          | 583594001 | Key ( ' )      | 1    |              |           |                 |      |
| D4           | U50431001 | Key (Q)        | 1    |              |           |                 |      |
| D5           | 583589001 | Key ( W ± ¥ )  | 1    |              |           |                 |      |
| D6           | 583259001 | Key (E)        | 1    |              |           |                 |      |
| D7           | 583260001 | Key (R)        | 1    |              |           |                 |      |
| D8           | 583261001 | Key (T)        | 1    |              |           |                 |      |
| D9           | 583530001 | Key (Y)        | 1    |              |           |                 |      |
| D10          | 583590001 | Key ( U ° # )  | 1    |              |           |                 |      |
| D11          | 583264001 | Key (I)        | 1    |              |           |                 |      |
| D12          | 583265001 | Key (O)        | 1    |              |           |                 |      |
| D13          | 583266001 | Key (P)        | 1    |              |           |                 |      |
| D14          | 583591001 | Key ( + = )    | 1    |              |           |                 |      |
| D15          | 583592001 | Key ( ^   )    | 1    |              |           |                 |      |



KEY TOP (SWISS < GERMAN  
FRENCH)MAIN-  
REF. NO.

ZZ-15XF



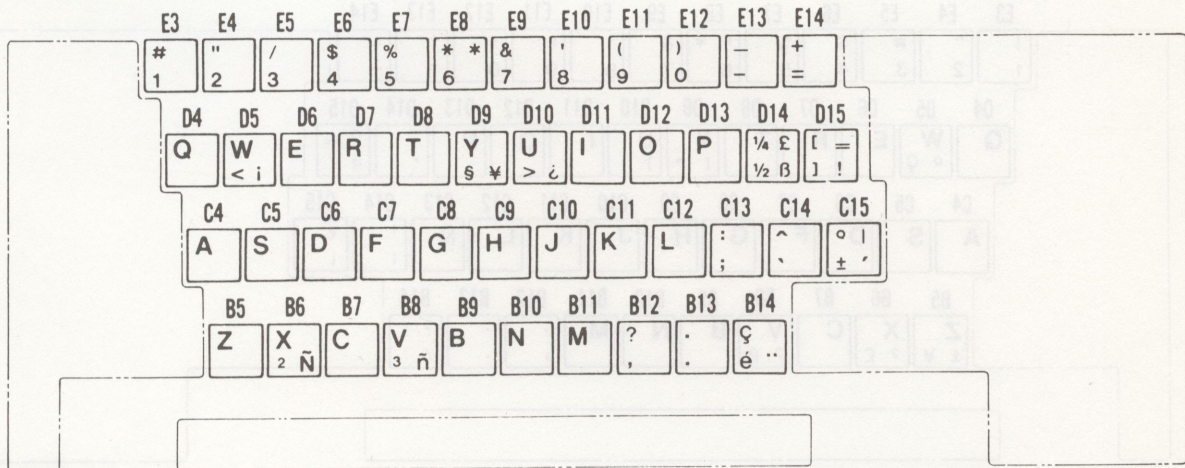
| SUB-REF. NO. | CODE      | NAME            | Q'TY | SUB-REF. NO. | CODE      | NAME        | Q'TY |
|--------------|-----------|-----------------|------|--------------|-----------|-------------|------|
| B5           | 583358001 | Key (Y)         | 1    | E3           | 583664001 | Key ( + 1 ) | 1    |
| B6           | 583676001 | Key ( X § )     | 1    | E4           | 583341001 | Key ( " 2 ) | 1    |
| B7           | 583290001 | Key (C)         | 1    | E5           | 583665001 | Key ( * 3 ) | 1    |
| B8           | 583677001 | Key ( V ° )     | 1    | E6           | 583666001 | Key ( ç 4 ) | 1    |
| B9           | 583292001 | Key (B)         | 1    | E7           | 583242001 | Key ( % 5 ) | 1    |
| B10          | 583293001 | Key (N)         | 1    | E8           | 583343001 | Key ( & 6 ) | 1    |
| B11          | 583294001 | Key (M)         | 1    | E9           | 583344001 | Key ( / 7 ) | 1    |
| B12          | 583361001 | Key ( ; , )     | 1    | E10          | 583345001 | Key ( ( 8 ) | 1    |
| B13          | 583362001 | Key ( : . )     | 1    | E11          | 583346001 | Key ( ) 9 ) | 1    |
| B14          | 583363001 | Key ( _ - )     | 1    | E12          | 583347001 | Key ( = 0 ) | 1    |
| C4           | 583273001 | Key (A)         | 1    | E13          | 583667001 | Key ( ? ' ) | 1    |
| C5           | 583274001 | Key (S)         | 1    | E14          | 583668001 | Key ( ` ^ ) | 1    |
| C6           | 583275001 | Key (D)         | 1    |              |           |             |      |
| C7           | 583276001 | Key (F)         | 1    |              |           |             |      |
| C8           | 583277001 | Key (G)         | 1    |              |           |             |      |
| C9           | 583278001 | Key (H)         | 1    |              |           |             |      |
| C10          | 583279001 | Key (J)         | 1    |              |           |             |      |
| C11          | 583280001 | Key (K)         | 1    |              |           |             |      |
| C12          | 583281001 | Key (L)         | 1    |              |           |             |      |
| C13          | 583673001 | Key ( é ö ö é ) | 1    |              |           |             |      |
| C14          | 583674001 | Key ( à ä ä à ) | 1    |              |           |             |      |
| C15          | 583675001 | Key ( £ \$ )    | 1    |              |           |             |      |
| D4           | U50431001 | Key (Q)         | 1    |              |           |             |      |
| D5           | 583669001 | Key ( W [ )     | 1    |              |           |             |      |
| D6           | 583259001 | Key (E)         | 1    |              |           |             |      |
| D7           | 583260001 | Key (R)         | 1    |              |           |             |      |
| D8           | 583261001 | Key (T)         | 1    |              |           |             |      |
| D9           | 583351001 | Key (Z)         | 1    |              |           |             |      |
| D10          | 583670001 | Key ( U ] )     | 1    |              |           |             |      |
| D11          | 583264001 | Key (I)         | 1    |              |           |             |      |
| D12          | 583265001 | Key (O)         | 1    |              |           |             |      |
| D13          | 583266001 | Key (P)         | 1    |              |           |             |      |
| D14          | 583671001 | Key ( è ü ü è ) | 1    |              |           |             |      |
| D15          | 583672001 | Key ( ' " )     | 1    |              |           |             |      |



## KEY TOP (BILINGUAL)

MAIN-  
REF. NO.

ZZ-15XG



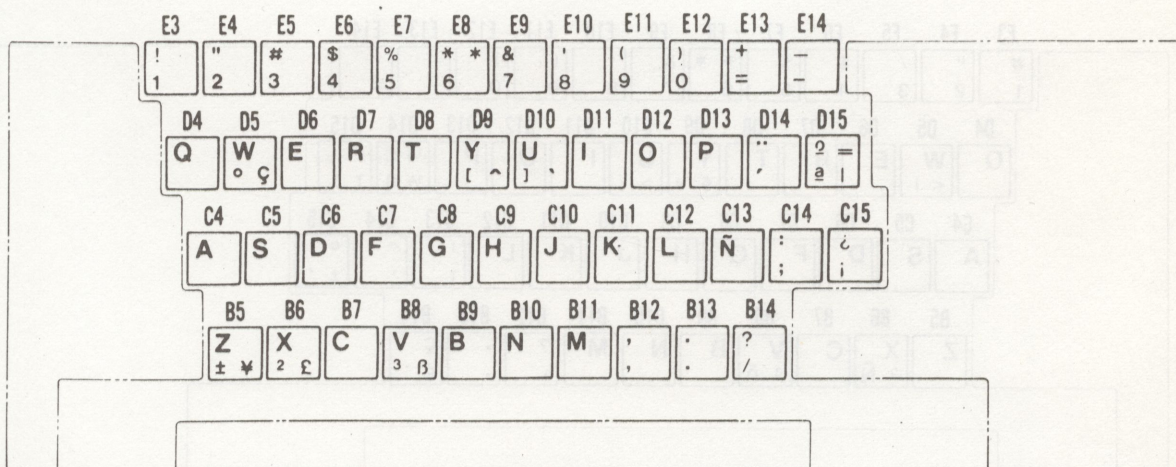
| SUB-REF. NO. | CODE      | NAME                     | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|--------------------------|------|--------------|-----------|---------------|------|
| B5           | 583595001 | Key (Z)                  | 1    | E3           | 583597001 | Key ( # 1 )   | 1    |
| B6           | 583359001 | Key ( X <sup>2</sup> Ñ ) | 1    | E4           | 583341001 | Key ( " 2 ) ) | 1    |
| B7           | 583290001 | Key (C)                  | 1    | E5           | 583598001 | Key ( / 3 )   | 1    |
| B8           | 583360001 | Key ( V <sup>3</sup> ñ ) | 1    | E6           | 583241001 | Key ( \$ 4 )  | 1    |
| B9           | 583292001 | Key (B)                  | 1    | E7           | 583242001 | Key ( % 5 )   | 1    |
| B10          | 583293001 | Key (N)                  | 1    | E8           | 583599001 | Key ( * 6 * ) | 1    |
| B11          | 583294001 | Key (M)                  | 1    | E9           | 583244001 | Key ( & 7 )   | 1    |
| B12          | 583539001 | Key ( ? , )              | 1    | E10          | 583586001 | Key ( ' 8 )   | 1    |
| B13          | 583332001 | Key ( . . )              | 1    | E11          | 583246001 | Key ( ( 9 )   | 1    |
| B14          | 583605001 | Key ( ç é )              | 1    | E12          | 583247001 | Key ( ) 0 )   | 1    |
| C4           | 583273001 | Key (A)                  | 1    | E13          | 583565001 | Key ( _ - )   | 1    |
| C5           | 583274001 | Key (S)                  | 1    | E14          | 583249001 | Key ( + = )   | 1    |
| C6           | 583275001 | Key (D)                  | 1    |              |           |               |      |
| C7           | 583276001 | Key (F)                  | 1    |              |           |               |      |
| C8           | 583277001 | Key (G)                  | 1    |              |           |               |      |
| C9           | 583278001 | Key (H)                  | 1    |              |           |               |      |
| C10          | 583279001 | Key (J)                  | 1    |              |           |               |      |
| C11          | 583280001 | Key (K)                  | 1    |              |           |               |      |
| C12          | 583281001 | Key (L)                  | 1    |              |           |               |      |
| C13          | 583569001 | Key ( : ; )              | 1    |              |           |               |      |
| C14          | 583603001 | Key ( ^ ` )              | 1    |              |           |               |      |
| C15          | 583604001 | Key ( ° ± )              | 1    |              |           |               |      |
| D4           | U50431001 | Key (Q)                  | 1    |              |           |               |      |
| D5           | 583566001 | Key ( W < i )            | 1    |              |           |               |      |
| D6           | 583259001 | Key (E)                  | 1    |              |           |               |      |
| D7           | 583260001 | Key (R)                  | 1    |              |           |               |      |
| D8           | 583261001 | Key (T)                  | 1    |              |           |               |      |
| D9           | 583600001 | Key ( Y § ¥ )            | 1    |              |           |               |      |
| D10          | 583568001 | Key ( U > ÿ )            | 1    |              |           |               |      |
| D11          | 583264001 | Key (I)                  | 1    |              |           |               |      |
| D12          | 583265001 | Key (O)                  | 1    |              |           |               |      |
| D13          | 583266001 | Key (P)                  | 1    |              |           |               |      |
| D14          | 583601001 | Key ( ¼ ½ £ β )          | 1    |              |           |               |      |
| D15          | 583602001 | Key ( [ ] = ! )          | 1    |              |           |               |      |



# KEY TOP (SPANISH < SOUTH AMERICA CENTRAL AMERICA)

 MAIN-  
REF. NO.

ZZ-15XH



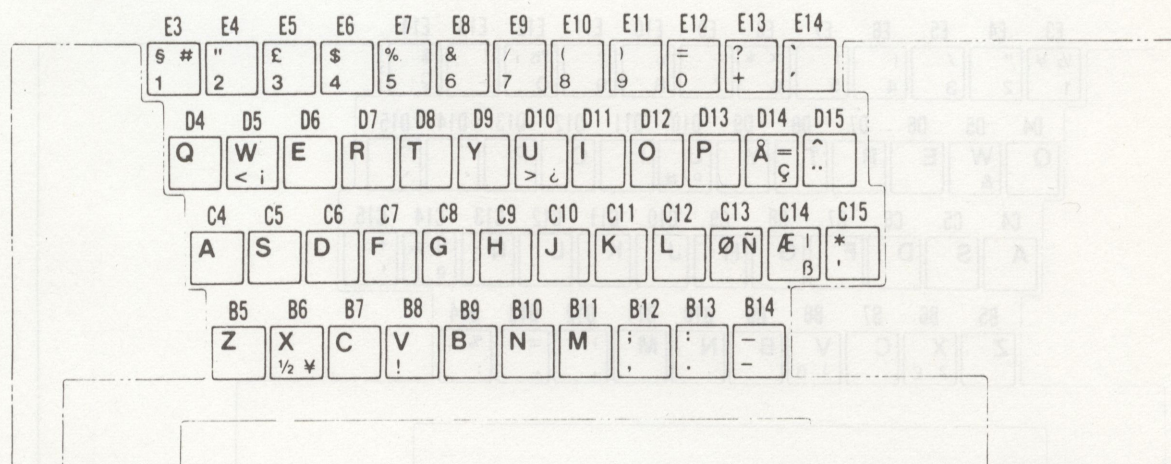
| SUB-REF. NO. | CODE      | NAME            | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|-----------------|------|--------------|-----------|---------------|------|
| B5           | 583616001 | Key ( Z ± ¥ )   | 1    | E3           | U50429001 | Key ( ! 1 )   | 1    |
| B6           | 583703001 | Key ( X ² £ )   | 1    | E4           | 583341001 | Key ( " 2 )   | 1    |
| B7           | 583290001 | Key ( C )       | 1    | E5           | 583562001 | Key ( # 3 )   | 1    |
| B8           | 583704001 | Key ( V ³ ß )   | 1    | E6           | 583241001 | Key ( \$ 4 )  | 1    |
| B9           | 583292001 | Key ( D )       | 1    | E7           | 583242001 | Key ( % 5 )   | 1    |
| B10          | 583293001 | Key ( N )       | 1    | E8           | 583599001 | Key ( * 6 * ) | 1    |
| B11          | 583294001 | Key ( M )       | 1    | E9           | 583244001 | Key ( & 7 )   | 1    |
| B12          | 583571001 | Key ( , , )     | 1    | E10          | 583586001 | Key ( ' 8 )   | 1    |
| B13          | 583332001 | Key ( . . )     | 1    | E11          | 583246001 | Key ( ( 9 )   | 1    |
| B14          | 583572001 | Key ( ? / )     | 1    | E12          | 583247001 | Key ( ) 0 )   | 1    |
| C4           | 583273001 | Key ( A )       | 1    | E13          | 583249001 | Key ( + = )   | 1    |
| C5           | 583274001 | Key ( S )       | 1    | E14          | 583565001 | Key ( - - )   | 1    |
| C6           | 583275001 | Key ( D )       | 1    |              |           |               |      |
| C7           | 583276001 | Key ( F )       | 1    |              |           |               |      |
| C8           | 583277001 | Key ( G )       | 1    |              |           |               |      |
| C9           | 583278001 | Key ( H )       | 1    |              |           |               |      |
| C10          | 583279001 | Key ( J )       | 1    |              |           |               |      |
| C11          | 583280001 | Key ( K )       | 1    |              |           |               |      |
| C12          | 583281001 | Key ( L )       | 1    |              |           |               |      |
| C13          | 583700001 | Key ( Ñ )       | 1    |              |           |               |      |
| C14          | 583569001 | Key ( : ; )     | 1    |              |           |               |      |
| C15          | 583746001 | Key ( ¿ i )     | 1    |              |           |               |      |
| D4           | U50431001 | Key ( Q )       | 1    |              |           |               |      |
| D5           | 583350001 | Key ( W ° ¢ )   | 1    |              |           |               |      |
| D6           | 583259001 | Key ( E )       | 1    |              |           |               |      |
| D7           | 583260001 | Key ( R )       | 1    |              |           |               |      |
| D8           | 583261001 | Key ( T )       | 1    |              |           |               |      |
| D9           | 583743001 | Key ( Y [ ^ )   | 1    |              |           |               |      |
| D10          | 583744001 | Key ( U ] ` )   | 1    |              |           |               |      |
| D11          | 583264001 | Key ( I )       | 1    |              |           |               |      |
| D12          | 583265001 | Key ( O )       | 1    |              |           |               |      |
| D13          | 583266001 | Key ( P )       | 1    |              |           |               |      |
| D14          | 583698001 | Key ( " ' )     | 1    |              |           |               |      |
| D15          | 583745001 | Key ( ¨ ª = ¡ ) | 1    |              |           |               |      |



## KEY TOP (NORWEGIAN)

MAIN-  
REF. NO.

ZZ-15XI



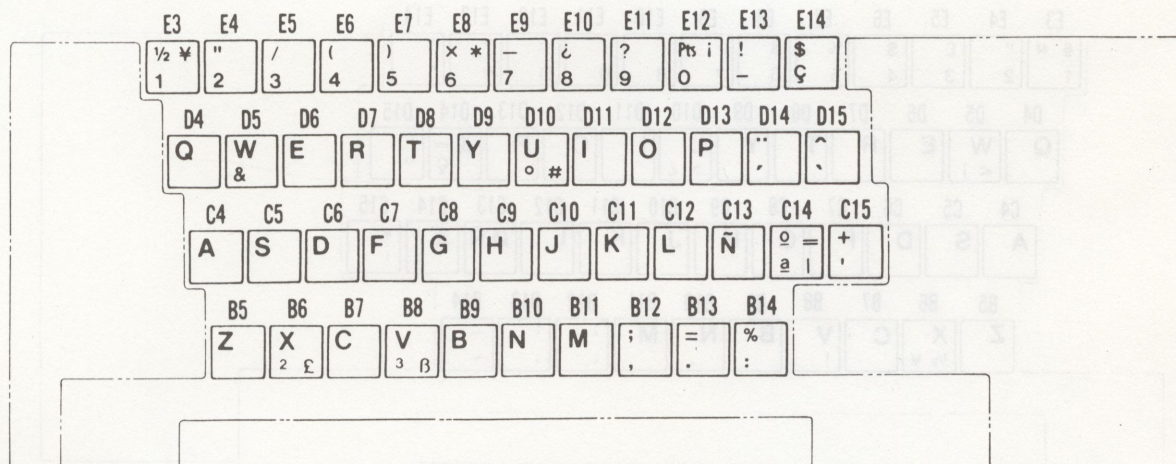
| SUB-REF. NO. | CODE      | NAME          | Q'TY | SUB-REF. NO. | CODE      | NAME        | Q'TY |
|--------------|-----------|---------------|------|--------------|-----------|-------------|------|
| B5           | 583595001 | Key (Z)       | 1    | E3           | 583678001 | Key ( S # ) | 1    |
| B6           | 583685001 | Key ( X ½ ¥ ) | 1    | E4           | 583341001 | Key ( " )   | 1    |
| B7           | 583290001 | Key (C)       | 1    | E5           | 583584001 | Key ( £ )   | 1    |
| B8           | 583686001 | Key ( V ! )   | 1    | E6           | 583241001 | Key ( \$ )  | 1    |
| B9           | 583292001 | Key (B)       | 1    | E7           | 583242001 | Key ( % )   | 1    |
| B10          | 583293001 | Key (N)       | 1    | E8           | 583343001 | Key ( & )   | 1    |
| B11          | 583294001 | Key (M)       | 1    | E9           | 583344001 | Key ( / )   | 1    |
| B12          | 583361001 | Key ( ; , )   | 1    | E10          | 583345001 | Key ( ( ) ) | 1    |
| B13          | 583362001 | Key ( : . )   | 1    | E11          | 583346001 | Key ( ) )   | 1    |
| B14          | 583363001 | Key ( _ - )   | 1    | E12          | 583347001 | Key ( = )   | 1    |
| C4           | 583273001 | Key (A)       | 1    | E13          | 583679001 | Key ( ? + ) | 1    |
| C5           | 583274001 | Key (S)       | 1    | E14          | 583349001 | Key ( ` )   | 1    |
| C6           | 583275001 | Key (D)       | 1    |              |           |             |      |
| C7           | 583276001 | Key (F)       | 1    |              |           |             |      |
| C8           | 583277001 | Key (G)       | 1    |              |           |             |      |
| C9           | 583278001 | Key (H)       | 1    |              |           |             |      |
| C10          | 583279001 | Key (J)       | 1    |              |           |             |      |
| C11          | 583280001 | Key (K)       | 1    |              |           |             |      |
| C12          | 583281001 | Key (L)       | 1    |              |           |             |      |
| C13          | 583682001 | Key ( ø Ñ )   | 1    |              |           |             |      |
| C14          | 583683001 | Key ( Æ   β ) | 1    |              |           |             |      |
| C15          | 583684001 | Key ( * ' )   | 1    |              |           |             |      |
| D4           | U50431001 | Key (Q)       | 1    |              |           |             |      |
| D5           | 583566001 | Key ( W < i ) | 1    |              |           |             |      |
| D6           | 583259001 | Key (E)       | 1    |              |           |             |      |
| D7           | 583260001 | Key (R)       | 1    |              |           |             |      |
| D8           | 583261001 | Key (T)       | 1    |              |           |             |      |
| D9           | 583530001 | Key (Y)       | 1    |              |           |             |      |
| D10          | 583568001 | Key ( U > i ) | 1    |              |           |             |      |
| D11          | 583264001 | Key (I)       | 1    |              |           |             |      |
| D12          | 583265001 | Key (O)       | 1    |              |           |             |      |
| D13          | 583266001 | Key (P)       | 1    |              |           |             |      |
| D14          | 583680001 | Key ( Å = ç ) | 1    |              |           |             |      |
| D15          | 583681001 | Key ( ^ " )   | 1    |              |           |             |      |



## KEY TOP (SPANISH FOR SPAIN)

MAIN-  
REF. NO.

ZZ-15XJ



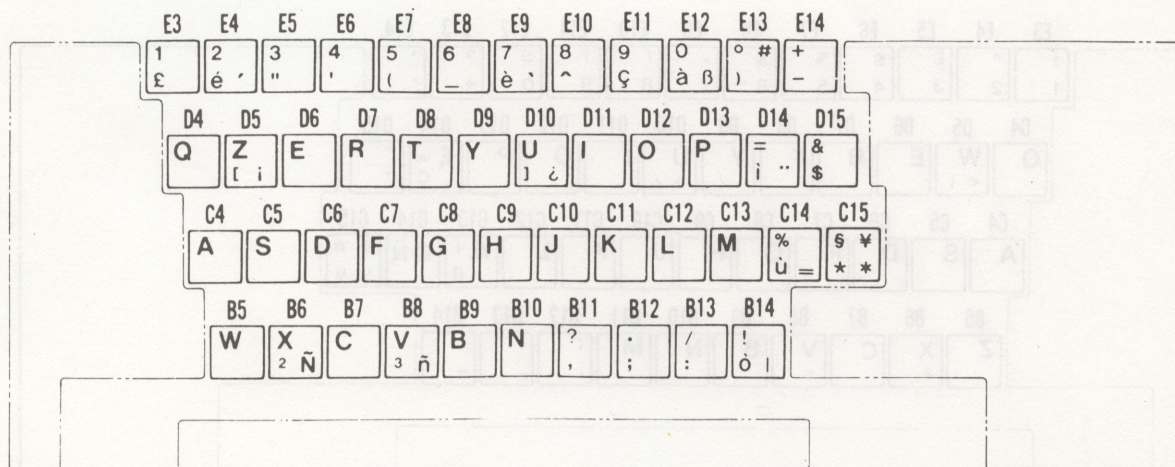
| SUB-REF. NO. | CODE      | NAME            | Q'TY | SUB-REF. NO. | CODE      | NAME            | Q'TY |
|--------------|-----------|-----------------|------|--------------|-----------|-----------------|------|
| B5           | 583595001 | Key (Z)         | 1    | E3           | 583687001 | Key ( ½ 1 ¢ )   | 1    |
| B6           | 583703001 | Key ( X ² £ )   | 1    | E4           | 583341001 | Key ( " 2 )     | 1    |
| B7           | 583290001 | Key (C)         | 1    | E5           | 583598001 | Key ( / 3 )     | 1    |
| B8           | 583704001 | Key ( V ³ ß )   | 1    | E6           | 583688001 | Key ( ( 4 )     | 1    |
| B9           | 583292001 | Key (B)         | 1    | E7           | 583689001 | Key ( ) 5 )     | 1    |
| B10          | 583293001 | Key (N)         | 1    | E8           | 583690001 | Key ( X 6 * )   | 1    |
| B11          | 583294001 | Key (M)         | 1    | E9           | 583691001 | Key ( _ 7 )     | 1    |
| B12          | 583361001 | Key ( ; , )     | 1    | E10          | 583692001 | Key ( ¿ 8 )     | 1    |
| B13          | 583705001 | Key ( = . )     | 1    | E11          | 583693001 | Key ( ? 9 )     | 1    |
| B14          | 583706001 | Key ( % : )     | 1    | E12          | 583694001 | Key ( Prs 0 i ) | 1    |
| C4           | 583273001 | Key (A)         | 1    | E13          | 583695001 | Key ( ! - )     | 1    |
| C5           | 583274001 | Key (S)         | 1    | E14          | 583696001 | Key ( \$ ¢ )    | 1    |
| C6           | 583275001 | Key (D)         | 1    |              |           |                 |      |
| C7           | 583276001 | Key (F)         | 1    |              |           |                 |      |
| C8           | 583277001 | Key (G)         | 1    |              |           |                 |      |
| C9           | 583278001 | Key (H)         | 1    |              |           |                 |      |
| C10          | 583279001 | Key (J)         | 1    |              |           |                 |      |
| C11          | 583280001 | Key (K)         | 1    |              |           |                 |      |
| C12          | 583281001 | Key (L)         | 1    |              |           |                 |      |
| C13          | 583700001 | Key (Ñ)         | 1    |              |           |                 |      |
| C14          | 583701001 | Key ( ñ a = i ) | 1    |              |           |                 |      |
| C15          | 583702001 | Key ( + ' )     | 1    |              |           |                 |      |
| D4           | U50431001 | Key (Q)         | 1    |              |           |                 |      |
| D5           | 583697001 | Key ( W & )     | 1    |              |           |                 |      |
| D6           | 583259001 | Key (E)         | 1    |              |           |                 |      |
| D7           | 583260001 | Key (R)         | 1    |              |           |                 |      |
| D8           | 583261001 | Key (T)         | 1    |              |           |                 |      |
| D9           | 583530001 | Key (Y)         | 1    |              |           |                 |      |
| D10          | 583590001 | Key ( U ° # )   | 1    |              |           |                 |      |
| D11          | 583264001 | Key (I)         | 1    |              |           |                 |      |
| D12          | 583265001 | Key (O)         | 1    |              |           |                 |      |
| D13          | 583266001 | Key (P)         | 1    |              |           |                 |      |
| D14          | 583698001 | Key ( " ' )     | 1    |              |           |                 |      |
| D15          | 583699001 | Key ( ^ ` )     | 1    |              |           |                 |      |



## KEY TOP (ITALIAN)

MAIN-  
REF. NO.

ZZ-15XK



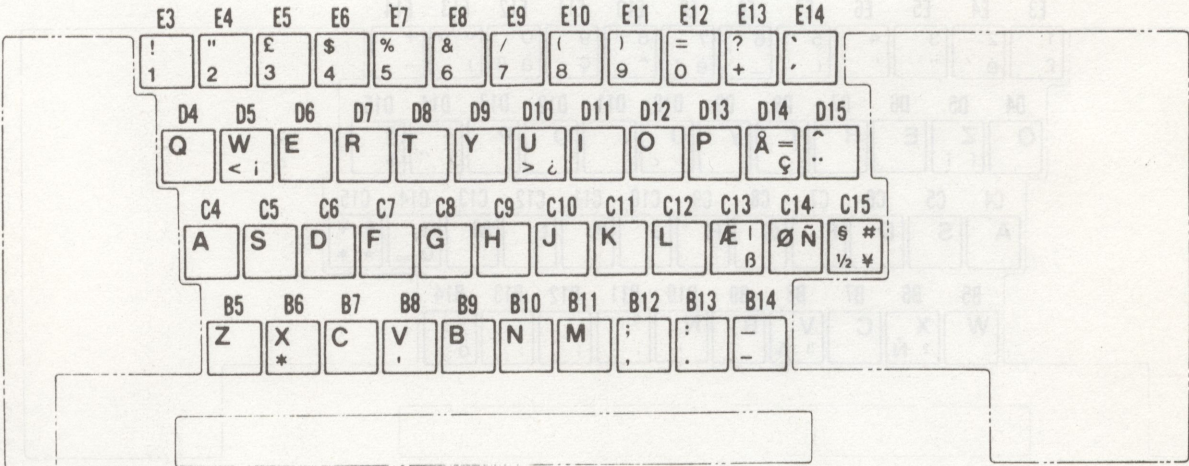
| SUB-REF. NO. | CODE      | NAME                     | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|--------------------------|------|--------------|-----------|---------------|------|
| B5           | 583538001 | Key (W)                  | 1    | E3           | 583573001 | Key ( 1 £ )   | 1    |
| B6           | 583359001 | Key ( X <sup>2</sup> Ñ ) | 1    | E4           | 583518001 | Key ( 2 é ' ) | 1    |
| B7           | 583290001 | Key (C)                  | 1    | E5           | 583519001 | Key ( 3 " )   | 1    |
| B8           | 583360001 | Key ( V <sup>3</sup> ñ ) | 1    | E6           | 583520001 | Key ( 4 ' )   | 1    |
| B9           | 583292001 | Key (B)                  | 1    | E7           | 583521001 | Key ( 5 ( )   | 1    |
| B10          | 583293001 | Key (N)                  | 1    | E8           | 583574001 | Key ( 6 - )   | 1    |
| B11          | 583539001 | Key ( ? , )              | 1    | E9           | 583523001 | Key ( 7 è ` ) | 1    |
| B12          | 583361001 | Key ( . ; )              | 1    | E10          | 583575001 | Key ( 8 ^ )   | 1    |
| B13          | 583541001 | Key ( / : )              | 1    | E11          | 583525001 | Key ( 9 ç )   | 1    |
| B14          | 583582001 | Key ( ! ò   )            | 1    | E12          | 583526001 | Key ( 0 à ß ) | 1    |
| C4           | 583273001 | Key (A)                  | 1    | E13          | 583527001 | Key ( ° ) # ) | 1    |
| C5           | 583274001 | Key (S)                  | 1    | E14          | 583576001 | Key ( + - )   | 1    |
| C6           | 583275001 | Key (D)                  | 1    |              |           |               |      |
| C7           | 583276001 | Key (F)                  | 1    |              |           |               |      |
| C8           | 583277001 | Key (G)                  | 1    |              |           |               |      |
| C9           | 583278001 | Key (H)                  | 1    |              |           |               |      |
| C10          | 583279001 | Key (J)                  | 1    |              |           |               |      |
| C11          | 583280001 | Key (K)                  | 1    |              |           |               |      |
| C12          | 583281001 | Key (L)                  | 1    |              |           |               |      |
| C13          | 583535001 | Key (M)                  | 1    |              |           |               |      |
| C14          | 583536001 | Key ( % ù = )            | 1    |              |           |               |      |
| C15          | 583581001 | Key ( § * ¥ * )          | 1    |              |           |               |      |
| D4           | U50431001 | Key (Q)                  | 1    |              |           |               |      |
| D5           | 583577001 | Key ( Z [ ; )            | 1    |              |           |               |      |
| D6           | 583259001 | Key (E)                  | 1    |              |           |               |      |
| D7           | 583260001 | Key (R)                  | 1    |              |           |               |      |
| D8           | 583261001 | Key (T)                  | 1    |              |           |               |      |
| D9           | 583530001 | Key (Y)                  | 1    |              |           |               |      |
| D10          | 583578001 | Key ( U ] ¿ )            | 1    |              |           |               |      |
| D11          | 583264001 | Key (I)                  | 1    |              |           |               |      |
| D12          | 583265001 | Key (O)                  | 1    |              |           |               |      |
| D13          | 583266001 | Key (P)                  | 1    |              |           |               |      |
| D14          | 583579001 | Key ( = ì " )            | 1    |              |           |               |      |
| D15          | 583580001 | Key ( & \$ )             | 1    |              |           |               |      |



KEY TOP (DANISH)

MAIN-REF. NO.

ZZ-15XL



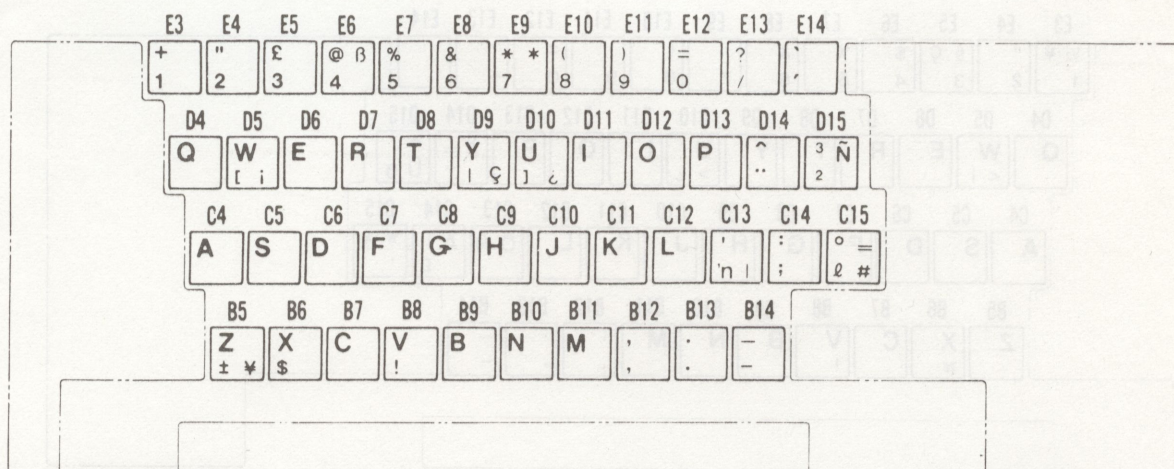
| SUB-REF. NO. | CODE      | NAME            | Q'TY | SUB-REF. NO. | CODE      | NAME         | Q'TY |
|--------------|-----------|-----------------|------|--------------|-----------|--------------|------|
| B5           | 583595001 | Key (Z)         | 1    | E3           | U50429001 | Key ( ! 1 )  | 1    |
| B6           | 583708001 | Key (X * )      | 1    | E4           | 583341001 | Key ( " 2 )  | 1    |
| B7           | 583290001 | Key (C)         | 1    | E5           | 583584001 | Key ( £ 3 )  | 1    |
| B8           | 583709001 | Key ( V ' )     | 1    | E6           | 583241001 | Key ( \$ 4 ) | 1    |
| B9           | 583292001 | Key (B)         | 1    | E7           | 583242001 | Key ( % 5 )  | 1    |
| B10          | 583293001 | Key (N)         | 1    | E8           | 583343001 | Key ( & 6 )  | 1    |
| B11          | 583294001 | Key (M)         | 1    | E9           | 583344001 | Key ( / 7 )  | 1    |
| B12          | 583361001 | Key ( ; , )     | 1    | E10          | 583345001 | Key ( ( 8 )  | 1    |
| B13          | 583362001 | Key ( : . )     | 1    | E11          | 583346001 | Key ( ) 9 )  | 1    |
| B14          | 583363001 | Key ( _ - )     | 1    | E12          | 583347001 | Key ( = 0 )  | 1    |
| C4           | 583273001 | Key (A)         | 1    | E13          | 583679001 | Key ( ? + )  | 1    |
| C5           | 583274001 | Key (S)         | 1    | E14          | 583349001 | Key ( ` ' )  | 1    |
| C6           | 583275001 | Key (D)         | 1    |              |           |              |      |
| C7           | 583276001 | Key (F)         | 1    |              |           |              |      |
| C8           | 583277001 | Key (G)         | 1    |              |           |              |      |
| C9           | 583278001 | Key (H)         | 1    |              |           |              |      |
| C10          | 583279001 | Key (J)         | 1    |              |           |              |      |
| C11          | 583280001 | Key (K)         | 1    |              |           |              |      |
| C12          | 583281001 | Key (L)         | 1    |              |           |              |      |
| C13          | 583683001 | Key ( Æ   β )   | 1    |              |           |              |      |
| C14          | 583682001 | Key ( ø Ñ )     | 1    |              |           |              |      |
| C15          | 583707001 | Key ( § ½ # ¥ ) | 1    |              |           |              |      |
| D4           | U50431001 | Key (Q)         | 1    |              |           |              |      |
| D5           | 583566001 | Key ( W < i )   | 1    |              |           |              |      |
| D6           | 583259001 | Key (E)         | 1    |              |           |              |      |
| D7           | 583260001 | Key (R)         | 1    |              |           |              |      |
| D8           | 583261001 | Key (T)         | 1    |              |           |              |      |
| D9           | 583530001 | Key (Y)         | 1    |              |           |              |      |
| D10          | 583568001 | Key ( U > j )   | 1    |              |           |              |      |
| D11          | 583264001 | Key (I)         | 1    |              |           |              |      |
| D12          | 583265001 | Key (O)         | 1    |              |           |              |      |
| D13          | 583266001 | Key (P)         | 1    |              |           |              |      |
| D14          | 583680001 | Key ( Å = ç )   | 1    |              |           |              |      |
| D15          | 583681001 | Key ( ^ .. )    | 1    |              |           |              |      |



## KEY TOP (SOUTH AFRICA)

MAIN-  
REF. NO.

ZZ-15XM



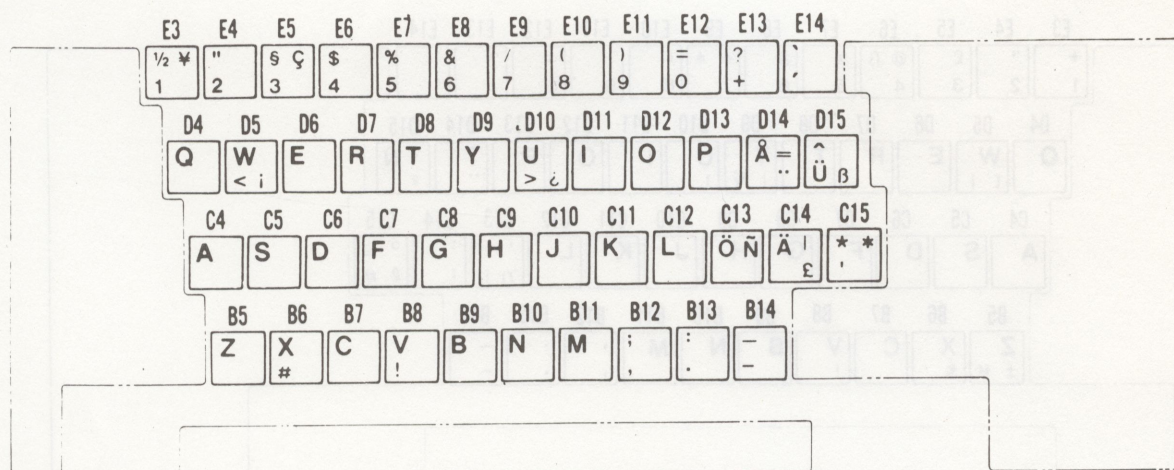
| SUB-REF. NO. | CODE      | NAME            | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|-----------------|------|--------------|-----------|---------------|------|
| B5           | 583616001 | Key ( Z ± ¥ )   | 1    | E3           | 583664001 | Key ( + 1 )   | 1    |
| B6           | 583716001 | Key ( X \$ )    | 1    | E4           | 583341001 | Key ( " 2 )   | 1    |
| B7           | 583290001 | Key ( C )       | 1    | E5           | 583484001 | Key ( £ 3 )   | 1    |
| B8           | 583686001 | Key ( V ! )     | 1    | E6           | 583607001 | Key ( @ 4 β ) | 1    |
| B9           | 583292001 | Key ( B )       | 1    | E7           | 583242001 | Key ( % 5 )   | 1    |
| B10          | 583293001 | Key ( N )       | 1    | E8           | 583343001 | Key ( & 6 )   | 1    |
| B11          | 583294001 | Key ( M )       | 1    | E9           | 583710001 | Key ( * 7 * ) | 1    |
| B12          | 583571001 | Key ( , , )     | 1    | E10          | 583345001 | Key ( ( 8 )   | 1    |
| B13          | 583332001 | Key ( . . )     | 1    | E11          | 583346001 | Key ( ) 9 )   | 1    |
| B14          | 583363001 | Key ( _ - )     | 1    | E12          | 583347001 | Key ( = 0 )   | 1    |
| C4           | 583273001 | Key ( A )       | 1    | E13          | 583711001 | Key ( ? / )   | 1    |
| C5           | 583274001 | Key ( S )       | 1    | E14          | 583349001 | Key ( ` ' )   | 1    |
| C6           | 583275001 | Key ( D )       | 1    |              |           |               |      |
| C7           | 583276001 | Key ( F )       | 1    |              |           |               |      |
| C8           | 583277001 | Key ( G )       | 1    |              |           |               |      |
| C9           | 583278001 | Key ( H )       | 1    |              |           |               |      |
| C10          | 583279001 | Key ( J )       | 1    |              |           |               |      |
| C11          | 583280001 | Key ( K )       | 1    |              |           |               |      |
| C12          | 583281001 | Key ( L )       | 1    |              |           |               |      |
| C13          | 583714001 | Key ( ' n   )   | 1    |              |           |               |      |
| C14          | 583569001 | Key ( : ; )     | 1    |              |           |               |      |
| C15          | 583715001 | Key ( ° ¢ = # ) | 1    |              |           |               |      |
| D4           | U50431001 | Key ( Q )       | 1    |              |           |               |      |
| D5           | 583610001 | Key ( W [ i )   | 1    |              |           |               |      |
| D6           | 583259001 | Key ( E )       | 1    |              |           |               |      |
| D7           | 583260001 | Key ( R )       | 1    |              |           |               |      |
| D8           | 583261001 | Key ( T )       | 1    |              |           |               |      |
| D9           | 583712001 | Key ( Y [ ç )   | 1    |              |           |               |      |
| D10          | 583578001 | Key ( U [ ç )   | 1    |              |           |               |      |
| D11          | 583264001 | Key ( I )       | 1    |              |           |               |      |
| D12          | 583265001 | Key ( O )       | 1    |              |           |               |      |
| D13          | 583266001 | Key ( P )       | 1    |              |           |               |      |
| D14          | 583681001 | Key ( ^ " )     | 1    |              |           |               |      |
| D15          | 583713001 | Key ( ^ 2 Ñ )   | 1    |              |           |               |      |



## KEY TOP (SWEDISH)

MAIN-  
REF. NO.

ZZ-15XN



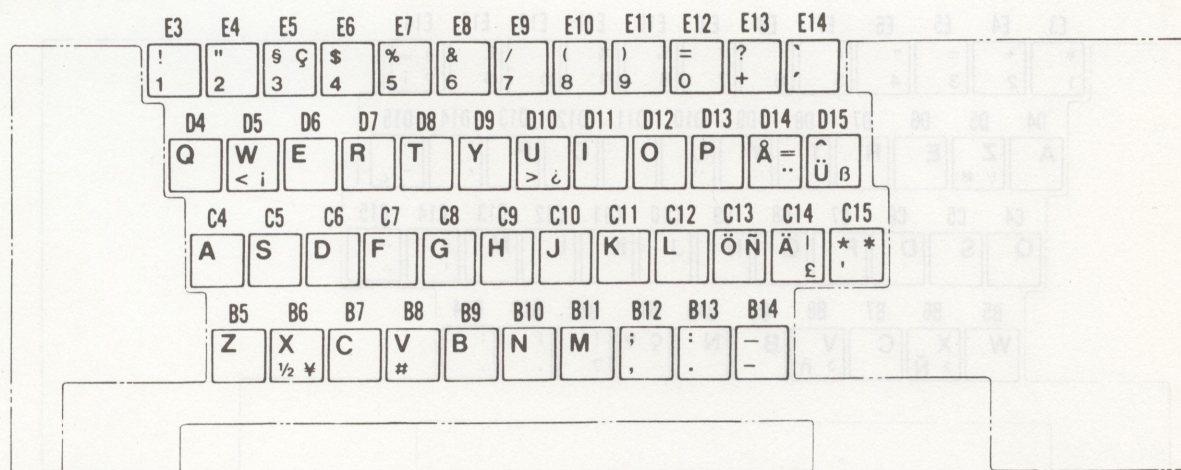
| SUB-REF. NO. | CODE      | NAME          | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|---------------|------|--------------|-----------|---------------|------|
| B5           | 583595001 | Key (Z)       | 1    | E3           | 583687001 | Key (½ 1 ¥)   | 1    |
| B6           | 583741001 | Key (X #)     | 1    | E4           | 583341001 | Key (" 2)     | 1    |
| B7           | 583290001 | Key (C)       | 1    | E5           | 583735001 | Key (§ 3 ¢)   | 1    |
| B8           | 583686001 | Key (V !)     | 1    | E6           | 583241001 | Key (\$ 4)    | 1    |
| B9           | 583292001 | Key (B)       | 1    | E7           | 583242001 | Key (% 5)     | 1    |
| B10          | 583293001 | Key (N)       | 1    | E8           | 583343001 | Key (& 6)     | 1    |
| B11          | 583294001 | Key (M)       | 1    | E9           | 583344001 | Key (/ 7)     | 1    |
| B12          | 583361001 | Key (; ,)     | 1    | E10          | 583345001 | Key (( 8)     | 1    |
| B13          | 583362001 | Key (: .)     | 1    | E11          | 583346001 | Key () 9)     | 1    |
| B14          | 583363001 | Key ( _ - )   | 1    | E12          | 583347001 | Key (= 0)     | 1    |
| C4           | 583273001 | Key (A)       | 1    | E13          | 583679001 | Key (? +)     | 1    |
| C5           | 583274001 | Key (S)       | 1    | E14          | 583349001 | Key ( ^ ü ß ) | 1    |
| C6           | 583275001 | Key (D)       | 1    |              |           |               |      |
| C7           | 583276001 | Key (F)       | 1    |              |           |               |      |
| C8           | 583277001 | Key (G)       | 1    |              |           |               |      |
| C9           | 583278001 | Key (H)       | 1    |              |           |               |      |
| C10          | 583279001 | Key (J)       | 1    |              |           |               |      |
| C11          | 583280001 | Key (K)       | 1    |              |           |               |      |
| C12          | 583281001 | Key (L)       | 1    |              |           |               |      |
| C13          | 583738001 | Key (ö Ñ)     | 1    |              |           |               |      |
| C14          | 583356001 | Key (Ä   £)   | 1    |              |           |               |      |
| C15          | 583740001 | Key (* ' *)   | 1    |              |           |               |      |
| D4           | U50431001 | Key (Q)       | 1    |              |           |               |      |
| D5           | 583566001 | Key (W < ;)   | 1    |              |           |               |      |
| D6           | 583259001 | Key (E)       | 1    |              |           |               |      |
| D7           | 583260001 | Key (R)       | 1    |              |           |               |      |
| D8           | 583261001 | Key (T)       | 1    |              |           |               |      |
| D9           | 583530001 | Key (Y)       | 1    |              |           |               |      |
| D10          | 583568001 | Key (U > ¸)   | 1    |              |           |               |      |
| D11          | 583264001 | Key (I)       | 1    |              |           |               |      |
| D12          | 583265001 | Key (O)       | 1    |              |           |               |      |
| D13          | 583266001 | Key (P)       | 1    |              |           |               |      |
| D14          | 583736001 | Key (Å = ")   | 1    |              |           |               |      |
| D15          | 583737001 | Key ( ^ ü ß ) | 1    |              |           |               |      |



## KEY TOP (FINNISH)

MAIN-  
REF. NO.

ZZ-15XO



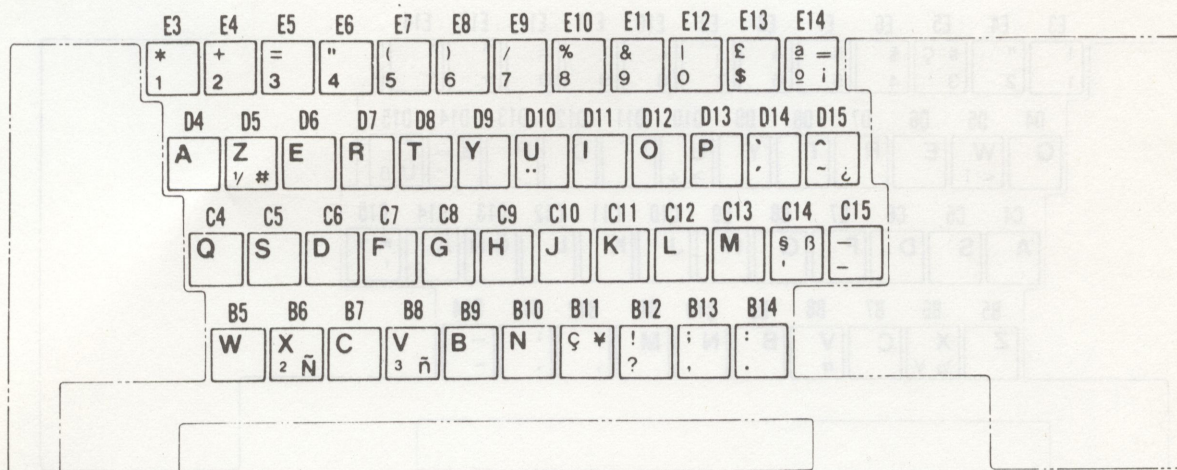
| SUB-REF. NO. | CODE      | NAME          | Q'TY | SUB-REF. NO. | CODE      | NAME          | Q'TY |
|--------------|-----------|---------------|------|--------------|-----------|---------------|------|
| B5           | 583595001 | Key (Z)       | 1    | E3           | U50429001 | Key ( ! 1 )   | 1    |
| B6           | 583685001 | Key ( X ½ ¥ ) | 1    | E4           | 583341001 | Key ( " 2 )   | 1    |
| B7           | 583290001 | Key (C)       | 1    | E5           | 583735001 | Key ( § 3 § ) | 1    |
| B8           | 583742001 | Key ( V # )   | 1    | E6           | 583241001 | Key ( \$ 4 )  | 1    |
| B9           | 583292001 | Key (B)       | 1    | E7           | 583242001 | Key ( % 5 )   | 1    |
| B10          | 583293001 | Key (N)       | 1    | E8           | 583343001 | Key ( & 6 )   | 1    |
| B11          | 583294001 | Key (M)       | 1    | E9           | 583344001 | Key ( / 7 )   | 1    |
| B12          | 583361001 | Key ( ; , )   | 1    | E10          | 583345001 | Key ( ( 8 )   | 1    |
| B13          | 583362001 | Key ( : . )   | 1    | E11          | 583346001 | Key ( ) 9 )   | 1    |
| B14          | 583363001 | Key ( _ - )   | 1    | E12          | 583347001 | Key ( = 0 )   | 1    |
| C4           | 583273001 | Key (A)       | 1    | E13          | 583679001 | Key ( ? + )   | 1    |
| C5           | 583274001 | Key (S)       | 1    | E14          | 583349001 | Key ( ` ´ )   | 1    |
| C6           | 583275001 | Key (D)       | 1    |              |           |               |      |
| C7           | 583276001 | Key (F)       | 1    |              |           |               |      |
| C8           | 583277001 | Key (G)       | 1    |              |           |               |      |
| C9           | 583278001 | Key (H)       | 1    |              |           |               |      |
| C10          | 583279001 | Key (J)       | 1    |              |           |               |      |
| C11          | 583280001 | Key (K)       | 1    |              |           |               |      |
| C12          | 583281001 | Key (L)       | 1    |              |           |               |      |
| C13          | 583738001 | Key ( Ö Ñ )   | 1    |              |           |               |      |
| C14          | 583356001 | Key ( Ä   £ ) | 1    |              |           |               |      |
| C15          | 583740001 | Key ( * ' * ) | 1    |              |           |               |      |
| D4           | U50431001 | Key (Q)       | 1    |              |           |               |      |
| D5           | 583566001 | Key ( W < i ) | 1    |              |           |               |      |
| D6           | 583259001 | Key (E)       | 1    |              |           |               |      |
| D7           | 583260001 | Key (R)       | 1    |              |           |               |      |
| D8           | 583261001 | Key (T)       | 1    |              |           |               |      |
| D9           | 583530001 | Key (Y)       | 1    |              |           |               |      |
| D10          | 583568001 | Key ( U > ü ) | 1    |              |           |               |      |
| D11          | 583264001 | Key (I)       | 1    |              |           |               |      |
| D12          | 583265001 | Key (O)       | 1    |              |           |               |      |
| D13          | 583266001 | Key (P)       | 1    |              |           |               |      |
| D14          | 583736001 | Key ( Å = " ) | 1    |              |           |               |      |
| D15          | 583737001 | Key ( ^ ü ß ) | 1    |              |           |               |      |



## KEY TOP (PORTUGUESE)

MAIN-  
REF. NO.

ZZ-15XP



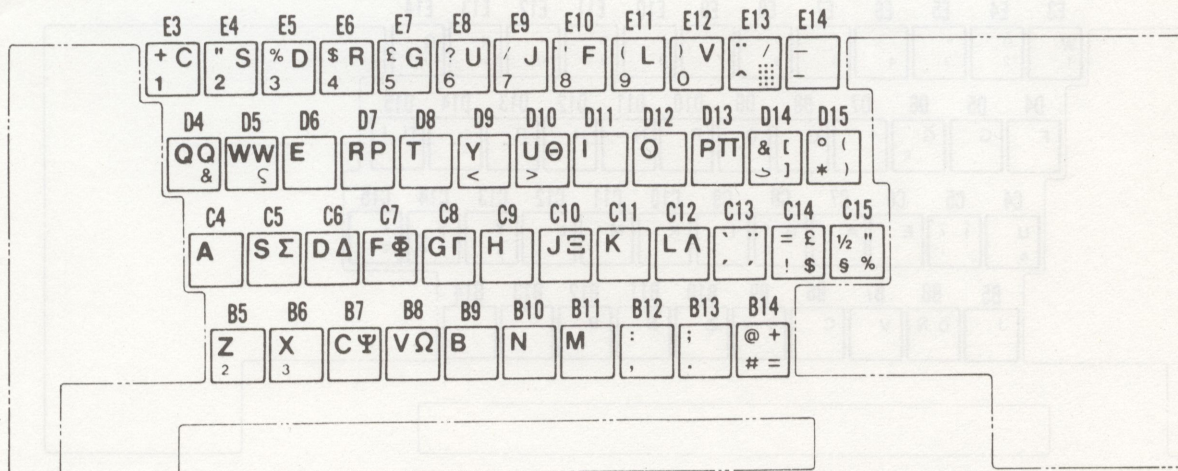
| SUB-REF. NO. | CODE      | NAME                       | Q'TY | SUB-REF. NO. | CODE      | NAME            | Q'TY |
|--------------|-----------|----------------------------|------|--------------|-----------|-----------------|------|
| B5           | 583538001 | Key (W)                    | 1    | E3           | 583606001 | Key ( * 1 )     | 1    |
| B6           | 583359001 | Key ( X <sup>2</sup> ñ )   | 1    | E4           | 583717001 | Key ( + 2 )     | 1    |
| B7           | 583290001 | Key (C)                    | 1    | E5           | 583718001 | Key ( = 3 )     | 1    |
| B8           | 583360001 | Key ( V <sup>3</sup> ñ )   | 1    | E6           | 583719001 | Key ( " 4 )     | 1    |
| B9           | 583292001 | Key (B)                    | 1    | E7           | 583720001 | Key ( ( 5 )     | 1    |
| B10          | 583293001 | Key (N)                    | 1    | E8           | 583721001 | Key ( ) 6 )     | 1    |
| B11          | 583733001 | Key ( ç Y )                | 1    | E9           | 583344001 | Key ( / 7 )     | 1    |
| B12          | 583734001 | Key ( ! ? )                | 1    | E10          | 583722001 | Key ( % 8 )     | 1    |
| B13          | 583361001 | Key ( ; , )                | 1    | E11          | 583723001 | Key ( & 9 )     | 1    |
| B14          | 583362001 | Key ( : . )                | 1    | E12          | 583724001 | Key (   0 )     | 1    |
| C4           | 583534001 | Key (Q)                    | 1    | E13          | 583725001 | Key ( £ \$ )    | 1    |
| C5           | 583274001 | Key (S)                    | 1    | E14          | 583726001 | Key ( _ o = ; ) | 1    |
| C6           | 583275001 | Key (D)                    | 1    |              |           |                 |      |
| C7           | 583276001 | Key (F)                    | 1    |              |           |                 |      |
| C8           | 583277001 | Key (G)                    | 1    |              |           |                 |      |
| C9           | 583278001 | Key (H)                    | 1    |              |           |                 |      |
| C10          | 583279001 | Key (J)                    | 1    |              |           |                 |      |
| C11          | 583280001 | Key (K)                    | 1    |              |           |                 |      |
| C12          | 583281001 | Key (L)                    | 1    |              |           |                 |      |
| C13          | 583535001 | Key (M)                    | 1    |              |           |                 |      |
| C14          | 583731001 | Key ( § ' β )              | 1    |              |           |                 |      |
| C15          | 583732001 | Key ( - - )                | 1    |              |           |                 |      |
| D4           | 583528001 | Key (A)                    | 1    |              |           |                 |      |
| D5           | 583727001 | Key ( Z <sup>1</sup> / # ) | 1    |              |           |                 |      |
| D6           | 583259001 | Key (E)                    | 1    |              |           |                 |      |
| D7           | 583260001 | Key (R)                    | 1    |              |           |                 |      |
| D8           | 583261001 | Key (T)                    | 1    |              |           |                 |      |
| D9           | 583530001 | Key (Y)                    | 1    |              |           |                 |      |
| D10          | 583728001 | Key ( U " )                | 1    |              |           |                 |      |
| D11          | 583264001 | Key (I)                    | 1    |              |           |                 |      |
| D12          | 583265001 | Key (O)                    | 1    |              |           |                 |      |
| D13          | 583266001 | Key (P)                    | 1    |              |           |                 |      |
| D14          | 583729001 | Key ( ` ' )                | 1    |              |           |                 |      |
| D15          | 583730001 | Key ( ^ ~ ÿ )              | 1    |              |           |                 |      |



## KEY TOP (LATIN &amp; GREEK)

MAIN-  
REF. NO.

ZZ-15XQ



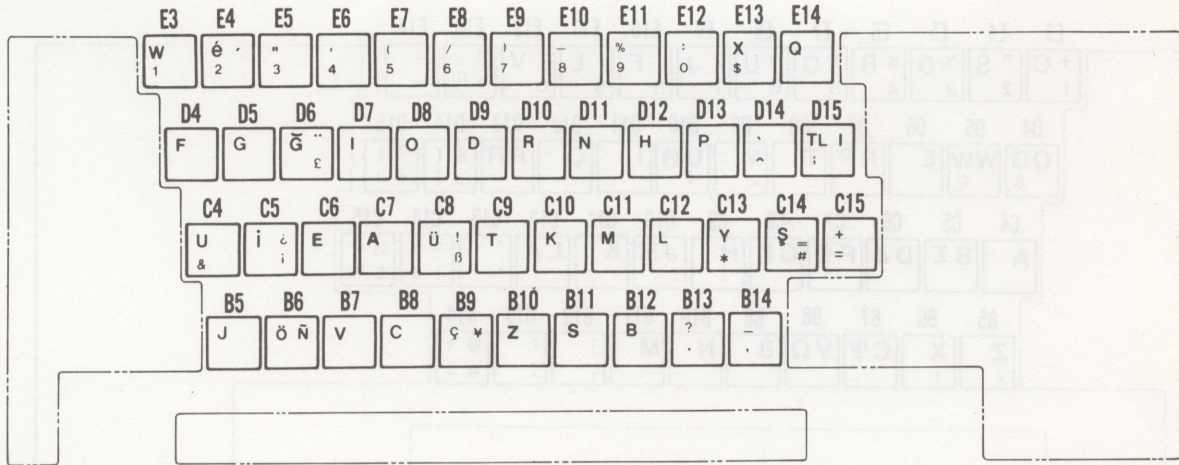
| SUB-REF. NO. | CODE      | NAME                   | Q'TY | SUB-REF. NO. | CODE      | NAME              | Q'TY |
|--------------|-----------|------------------------|------|--------------|-----------|-------------------|------|
| B5           | 583775001 | Key ( Z <sup>2</sup> ) | 1    | E3           | 583747001 | Key ( + 1 C )     | 1    |
| B6           | 583776001 | Key ( X <sup>3</sup> ) | 1    | E4           | 583748001 | Key ( " 2 S )     | 1    |
| B7           | 583777001 | Key ( C Ψ )            | 1    | E5           | 583749001 | Key ( % 3 D )     | 1    |
| B8           | 583778001 | Key ( V Ω )            | 1    | E6           | 583750001 | Key ( \$ 4 R )    | 1    |
| B9           | 583292001 | Key ( B )              | 1    | E7           | 583751001 | Key ( £ 5 G )     | 1    |
| B10          | 583293001 | Key ( N )              | 1    | E8           | 583752001 | Key ( ? 6 U )     | 1    |
| B11          | 583294001 | Key ( M )              | 1    | E9           | 583753001 | Key ( / 7 J )     | 1    |
| B12          | 583779001 | Key ( : , )            | 1    | E10          | 583754001 | Key ( ' 8 F )     | 1    |
| B13          | 583780001 | Key ( ; . )            | 1    | E11          | 583755001 | Key ( ( 9 L )     | 1    |
| B14          | 583781001 | Key ( @ # + = )        | 1    | E12          | 583756001 | Key ( ) 0 V )     | 1    |
| C4           | 583273001 | Key ( A )              | 1    | E13          | 583757001 | Key ( ` ^ / [ ] ) | 1    |
| C5           | 583766001 | Key ( S Σ )            | 1    | E14          | 583565001 | Key ( _ - )       | 1    |
| C6           | 583767001 | Key ( D Δ )            | 1    |              |           |                   |      |
| C7           | 583768001 | Key ( F Φ )            | 1    |              |           |                   |      |
| C8           | 583769001 | Key ( G Γ )            | 1    |              |           |                   |      |
| C9           | 583278001 | Key ( H )              | 1    |              |           |                   |      |
| C10          | 583770001 | Key ( J Ξ )            | 1    |              |           |                   |      |
| C11          | 583280001 | Key ( K )              | 1    |              |           |                   |      |
| C12          | 583771001 | Key ( L Λ )            | 1    |              |           |                   |      |
| C13          | 583772001 | Key ( ` ' " ' )        | 1    |              |           |                   |      |
| C14          | 583773001 | Key ( = ! £ \$ )       | 1    |              |           |                   |      |
| C15          | 583774001 | Key ( ½ § " % )        | 1    |              |           |                   |      |
| D4           | 583758001 | Key ( Q Q & )          | 1    |              |           |                   |      |
| D5           | 583759001 | Key ( W W S )          | 1    |              |           |                   |      |
| D6           | 583259001 | Key ( E )              | 1    |              |           |                   |      |
| D7           | 583760001 | Key ( R P )            | 1    |              |           |                   |      |
| D8           | 583261001 | Key ( T )              | 1    |              |           |                   |      |
| D9           | 583761001 | Key ( Y < )            | 1    |              |           |                   |      |
| D10          | 583762001 | Key ( U > O )          | 1    |              |           |                   |      |
| D11          | 583264001 | Key ( I )              | 1    |              |           |                   |      |
| D12          | 583265001 | Key ( O )              | 1    |              |           |                   |      |
| D13          | 583763001 | Key ( P π )            | 1    |              |           |                   |      |
| D14          | 583764001 | Key ( & [ ] )          | 1    |              |           |                   |      |
| D15          | 583765001 | Key ( ° * ( ) )        | 1    |              |           |                   |      |



## KEY TOP (TURKISH)

MAIN-  
REF. NO.

ZZ-15XR



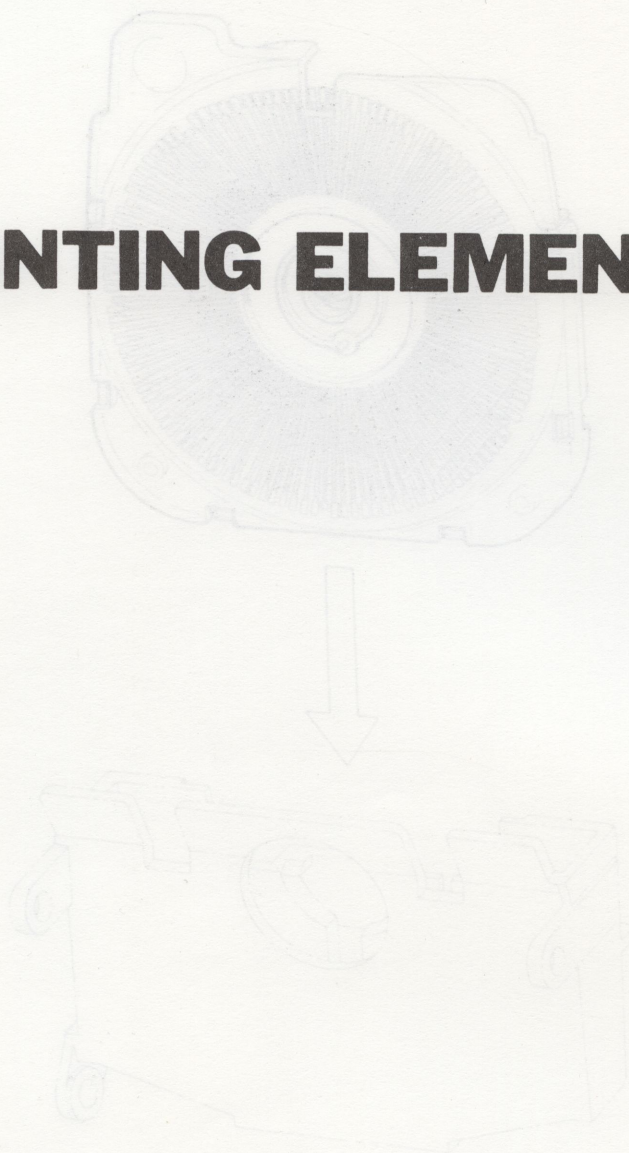
| SUB-REF. NO. | CODE      | NAME          | Q'TY | SUB-REF. NO. | CODE      | NAME           | Q'TY |
|--------------|-----------|---------------|------|--------------|-----------|----------------|------|
| B5           | 584168001 | Key (J)       | 1    | D4           | 584153001 | Key (F)        | 1    |
| B6           | 584169001 | Key ( Ö Ñ )   | 1    | D5           | 584154001 | Key (G)        | 1    |
| B7           | 584170001 | Key (V)       | 1    | D6           | 584155001 | Key ( Ğ " £ )  | 1    |
| B8           | 583290001 | Key (C)       | 1    | D7           | 583264001 | Key (I)        | 1    |
| B9           | 583733001 | Key ( Ç ¥ )   | 1    | D8           | 583265001 | Key (O)        | 1    |
| B10          | 583595001 | Key (Z)       | 1    | D9           | 584156001 | Key (D)        | 1    |
| B11          | 584171001 | Key (S)       | 1    | D10          | 583260001 | Key (R)        | 1    |
| B12          | 583292001 | Key (B)       | 1    | D11          | 584157001 | Key (N)        | 1    |
| B13          | 584172001 | Key ( ? . )   | 1    | D12          | 584158001 | Key (H)        | 1    |
| B14          | 584173001 | Key ( - , )   | 1    | D13          | 583266001 | Key (P)        | 1    |
|              |           |               |      | D14          | 584159001 | Key ( ^ ^ )    | 1    |
|              |           |               |      | D15          | 584160001 | Key ( TL   : ) | 1    |
| C4           | 584161001 | Key ( U & )   | 1    | E3           | 584142001 | Key ( W 1 )    | 1    |
| C5           | 584162001 | Key ( İ ı i ) | 1    | E4           | 584143001 | Key ( é 2 )    | 1    |
| C6           | 584163001 | Key (E)       | 1    | E5           | 584144001 | Key ( " 3 )    | 1    |
| C7           | 583273001 | Key (A)       | 1    | E6           | 584145001 | Key ( ' 4 )    | 1    |
| C8           | 584164001 | Key ( Ü ! B ) | 1    | E7           | 583720001 | Key ( ( 5 )    | 1    |
| C9           | 584165001 | Key (T)       | 1    | E8           | 584146001 | Key ( / 6 )    | 1    |
| C10          | 583280001 | Key (K)       | 1    | E9           | 584147001 | Key ( ) 7 )    | 1    |
| C11          | 583535001 | Key (M)       | 1    | E10          | 584148001 | Key ( _ 8 )    | 1    |
| C12          | 583281001 | Key (L)       | 1    | E11          | 584149001 | Key ( % 9 )    | 1    |
| C13          | 584166001 | Key ( Y * )   | 1    | E12          | 584150001 | Key ( : 0 )    | 1    |
| C14          | 584167001 | Key ( Ş # )   | 1    | E13          | 584151001 | Key ( X \$ )   | 1    |
| C15          | 583615001 | Key ( + = )   | 1    | E14          | 584152001 | Key (Q)        | 1    |



TF-003

MAIN-  
REF. NO.

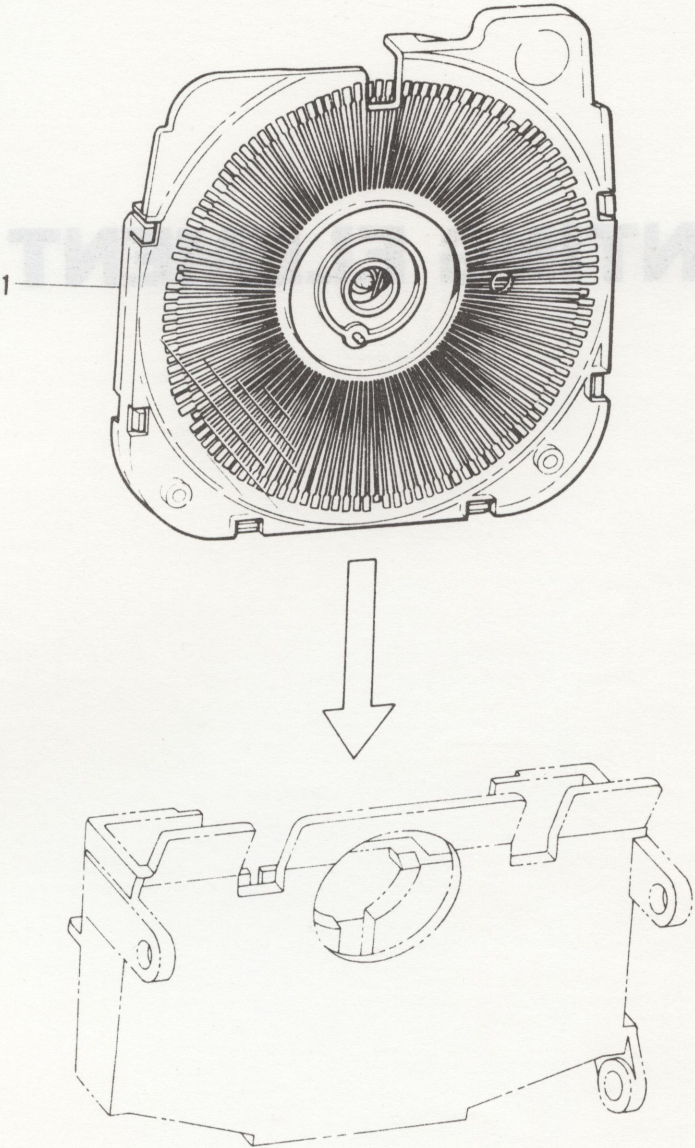
# PRINTING ELEMENT





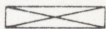
PRINTING ELEMENT

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-002 |
|-------------------|--------|





## PARTS CODE & PARTS NAME

| MAIN-REF. NO. | TF-002                                                                            | Functional group name | PRINTING ELEMENT |     |          |  | PRC FROM |
|---------------|-----------------------------------------------------------------------------------|-----------------------|------------------|-----|----------|--|----------|
| SUB-REF. NO.  | CODE                                                                              | NAME                  | Q'TY             | C/P | NEW CODE |  |          |
| 1             |  | Printing Element      | 1                |     |          |  |          |

## SPECIAL PARTS

|                             | QUADRO<br>1012 | PRESTIGE<br>1012 | QUADRO<br>15 | SCRIPT<br>1012 | P. ITALIC<br>1012 | PICA<br>10 | GRANDE<br>10 |
|-----------------------------|----------------|------------------|--------------|----------------|-------------------|------------|--------------|
|                             | CODE           | CODE             | CODE         | CODE           | CODE              | CODE       | CODE         |
| A. ENGLISH (U.S.A. only)    | 572130002      | 572132002        | 572134002    | 572136002      | 572409002         | 572415002  | 572459000    |
| GERMAN                      | 572138002      | 572140002        | 572182002    | 572184002      | 572411002         | 572419002  | 572461000    |
| K. ENGLISH                  | 572186002      | 572188002        | 572190002    | 572192002      | 572421002         | 572441002  | 572463000    |
| A. ENGLISH (Others)         | 572329002      | 572331002        | 572333002    | 572335001      | 572413002         | 572417002  | 572465000    |
| BILINGUAL                   | 572337002      | 572339002        | 572341002    | 572343002      | 572423002         | 572443002  | 572467000    |
| FRENCH                      | 572345002      | 572347002        | 572349002    | 572351002      | 572425002         | 572445002  | 572469000    |
| DUTCH                       | 572353002      | 572355002        | 572357002    | 572359002      | 572427002         | 572447002  |              |
| NORWEGIAN/DANISH            | 572361002      | 572363002        | 572365002    | 572365002      | 572429002         | 572449002  | 572471000    |
| S. (South Central) AMERICAN | 572369002      | 572371002        | 572373002    | 572375002      | 572431002         | 572451002  | 572473000    |
| SWISS                       | 572377002      | 572379002        | 572381002    | 572383002      | 572433002         | 572453002  | 572475000    |
| ITALIAN                     | 572385002      | 572387002        | 572389002    | 572391002      | 572435002         | 572455002  | 572477000    |
| S. SPAIN                    | 572393002      | 572395002        | 572397002    | 572399002      | 572437002         |            | 572479000    |
| FINNISH/SWEDISH             | 572401002      | 572403002        | 572405002    | 572407002      | 572439002         | 572457002  | 572481000    |
| SOUTH-AFRICAN               | 573531002      | 573527002        | 573535002    | 573539002      | 572534002         | 573630002  | 573635000    |
| PORTUGUESE                  | 573533002      | 573529002        | 573537002    | 573541002      | 572545002         |            |              |
| DANISH                      |                |                  |              |                |                   |            |              |
| SWEDISH                     |                |                  |              |                |                   |            |              |
| LATIN                       | 573733002      |                  |              |                | 573729002         | 573720002  |              |
| GREEK                       |                |                  |              |                |                   | 573716002  |              |
| INTERNATIONAL (U.S.A.)      |                | 573856002        | 573862002    |                |                   |            |              |
| INTERNATIONAL (Others)      |                | 573858002        | 573864002    |                |                   |            |              |
|                             |                |                  |              |                |                   |            |              |
|                             |                |                  |              |                |                   |            |              |
|                             |                |                  |              |                |                   |            |              |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

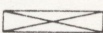


| DE | PRODUCTION |       | REMARK |
|----|------------|-------|--------|
|    | FROM       | UP TO |        |
|    |            |       |        |

| GRANDE<br>10 | ELITE<br>12 | BROUGHAM<br>10 | BROUGHAM<br>12 | OCR-B     | SYMBOL<br>10 | LETTER<br>GOTHIC 12 | OCR-A<br>10 | G. ITALIC<br>1012 | ANELIA<br>P.S | SUPER<br>GRANDE 10 |
|--------------|-------------|----------------|----------------|-----------|--------------|---------------------|-------------|-------------------|---------------|--------------------|
| CODE         | CODE        | CODE           | CODE           | CODE      | CODE         | CODE                | CODE        | CODE              | CODE          | CODE               |
| 572459002    | 572483002   | 572593002      | 572841002      | 572967002 | 573574002    | 573682002           | 573640002   |                   | 573608002     | 573901002          |
| 572461002    | 572485002   | 573891002      | 573038002      | 572965002 | 573291002    | 573684002           |             |                   | 573606002     | 573905002          |
| 572463002    | 572487002   | 572893002      | 573040002      | 572970002 | 573578002    | 573690002           |             |                   | 573779002     | 573907002          |
| 572465002    | 572489002   | 572897002      | 573036002      | 573034002 | 573580002    | 573686002           | 573647002   |                   | 573781002     | 573909002          |
| 572467002    | 572491002   | 572905002      | 573402002      | 572982002 | 573582002    | 573692002           |             |                   | 573783002     | 573911002          |
| 572469002    | 572493002   | 572895002      | 573042002      | 573568002 | 573584002    | 573694002           |             |                   | 573785002     | 573913002          |
|              | 572495002   | 572887002      | 573044002      | 572974002 | 573586002    | 573696002           |             |                   | 573787002     | 573915002          |
| 572471002    | 572497002   | 572899002      | 573046002      | 572976002 | 573588002    | 573698002           |             |                   | 573789002     | 573917002          |
| 572473002    | 572499002   | 572901002      | 573048002      | 572978002 | 573590002    | 573700002           |             |                   | 573791002     | 573919002          |
| 572475002    | 572587002   | 572903002      | 573050002      | 572980002 | 573592002    | 573702002           |             |                   | 573793002     | 573921002          |
| 572477002    | 572589002   | 572907002      | 573404002      | 572984002 | 573594002    | 573704002           |             |                   | 573795002     | 573923002          |
| 572479002    |             | 572909002      |                |           | 573596002    | 573706002           |             |                   | 573797002     | 573925002          |
| 572481002    | 572591002   | 572911002      | 573408002      | 572988002 | 573598002    | 573708002           |             |                   | 573799002     | 573927002          |
| 573635002    |             | 573551002      | 573555002      |           | 573600002    | 573710002           |             |                   | 573801002     | 573929002          |
|              |             |                |                |           | 573611002    | 573712002           |             |                   | 573803002     | 573931002          |
|              |             |                |                |           | 573623002    |                     |             |                   |               |                    |
|              |             |                |                |           | 573625002    |                     |             |                   |               |                    |
|              |             |                |                |           |              |                     |             |                   |               |                    |
|              |             |                |                |           |              |                     |             | 573724002         |               |                    |
|              |             | 573563002      |                |           | 573870002    |                     |             |                   | 573866002     |                    |
|              |             | 573860002      |                |           | 573872002    |                     |             |                   | 573868002     |                    |
|              |             |                |                |           |              |                     |             |                   |               |                    |
|              |             |                |                |           |              |                     |             |                   |               |                    |

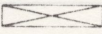


## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-002                                                                            | Functional group name | PRINTING ELEMENT |     |        |
|---------------|-----------------------------------------------------------------------------------|-----------------------|------------------|-----|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                  | Q'TY             | C/P | NEW CC |
| 1             |  | Printing Element      | 1                |     |        |

## SPECIAL PARTS

|                                | QUADRO<br>1012 | PRESTIGE<br>1012 | QUADRO<br>15 | SCRIPT<br>1012 | P. ITALIC<br>1012 | PICA<br>10 |
|--------------------------------|----------------|------------------|--------------|----------------|-------------------|------------|
|                                | CODE           | CODE             | CODE         | CODE           | CODE              | CODE       |
| A. ENGLISH<br>(U.S.A. only)    | 572130002      | 572132002        | 572134002    | 572136002      | 572409002         | 57241500   |
| GERMAN                         | 572138002      | 572140002        | 572182002    | 572184002      | 572411002         | 57241900   |
| K. ENGLISH                     | 572186002      | 572188002        | 572190002    | 572192002      | 572421002         | 57244100   |
| A. ENGLISH (Others)            | 572329002      | 572331002        | 572333002    | 572335001      | 572413002         | 57241700   |
| BILINGUAL                      | 572337002      | 572339002        | 572341002    | 572343002      | 572423002         | 57244300   |
| FRENCH                         | 572345002      | 572347002        | 572349002    | 572351002      | 572425002         | 57244500   |
| DUTCH                          | 572353002      | 572355002        | 572357002    | 572359002      | 572427002         | 57244700   |
| NORWEGIAN/DANISH               | 572361002      | 572363002        | 572365002    | 572365002      | 572429002         | 57244900   |
| S. (South<br>Central) AMERICAN | 572369002      | 572371002        | 572373002    | 572375002      | 572431002         | 57245100   |
| SWISS                          | 572377002      | 572379002        | 572381002    | 572383002      | 572433002         | 57245300   |
| ITALIAN                        | 572385002      | 572387002        | 572389002    | 572391002      | 572435002         | 57245500   |
| S. SPAIN                       | 572393002      | 572395002        | 572397002    | 572399002      | 572437002         |            |
| FINNISH/SWEDISH                | 572401002      | 572403002        | 572405002    | 572407002      | 572439002         | 57245700   |
| SOUTH-AFRICAN                  | 573531002      | 573527002        | 573535002    | 573539002      | 572534002         | 57363000   |
| PORTUGUESE                     | 573533002      | 573529002        | 573537002    | 573541002      | 572545002         |            |
| DANISH                         |                |                  |              |                |                   |            |
| SWEDISH                        |                |                  |              |                |                   |            |
| LATIN                          | 573733002      |                  |              |                | 573729002         | 57372000   |
| GREEK                          |                |                  |              |                |                   | 57371600   |
| INTERNATIONAL<br>(U.S.A.)      |                | 573856002        | 573862002    |                |                   |            |
| INTERNATIONAL<br>(Others)      |                | 573858002        | 573864002    |                |                   |            |
|                                |                |                  |              |                |                   |            |
|                                |                |                  |              |                |                   |            |
|                                |                |                  |              |                |                   |            |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

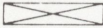
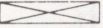
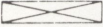


| DE | PRODUCTION |       | REMARK |
|----|------------|-------|--------|
|    | FROM       | UP TO |        |
|    |            |       |        |

| GRANDE<br>10 | ELITE<br>12 | BROUGHAM<br>10 | BROUGHAM<br>12 | OCR-B     | SYMBOL<br>10 | LETTER<br>GOTHIC 12 | OCR-A<br>10 | G. ITALIC<br>1012 | ANELIA<br>P.S | SUPER<br>GRANDE 10 |
|--------------|-------------|----------------|----------------|-----------|--------------|---------------------|-------------|-------------------|---------------|--------------------|
| CODE         | CODE        | CODE           | CODE           | CODE      | CODE         | CODE                | CODE        | CODE              | CODE          | CODE               |
| 572459002    | 572483002   | 572593002      | 572841002      | 572967002 | 573574002    | 573682002           | 573640002   |                   | 573608002     | 573901002          |
| 572461002    | 572485002   | 573891002      | 573038002      | 572965002 | 573291002    | 573684002           |             |                   | 573606002     | 573905002          |
| 572463002    | 572487002   | 572893002      | 573040002      | 572970002 | 573578002    | 573690002           |             |                   | 573779002     | 573907002          |
| 572465002    | 572489002   | 572897002      | 573036002      | 573034002 | 573580002    | 573686002           | 573647002   |                   | 573781002     | 573909002          |
| 572467002    | 572491002   | 572905002      | 573402002      | 572982002 | 573582002    | 573692002           |             |                   | 573783002     | 573911002          |
| 572469002    | 572493002   | 572895002      | 573042002      | 573568002 | 573584002    | 573694002           |             |                   | 573785002     | 573913002          |
|              | 572495002   | 572887002      | 573044002      | 572974002 | 573586002    | 573696002           |             |                   | 573787002     | 573915002          |
| 572471002    | 572497002   | 572899002      | 573046002      | 572976002 | 573588002    | 573698002           |             |                   | 573789002     | 573917002          |
| 572473002    | 572499002   | 572901002      | 573048002      | 572978002 | 573590002    | 573700002           |             |                   | 573791002     | 573419002          |
| 572475002    | 572587002   | 572903002      | 573050002      | 572980002 | 573592002    | 573702002           |             |                   | 573793002     | 573921002          |
| 572477002    | 572589002   | 572907002      | 573404002      | 572984002 | 573594002    | 573704002           |             |                   | 573795002     | 573923002          |
| 572479002    |             | 572909002      |                |           | 573596002    | 573706002           |             |                   | 573797002     | 573925002          |
| 572481002    | 572591002   | 572911002      | 573408002      | 572988002 | 573598002    | 573708002           |             |                   | 573799002     | 573927002          |
| 573635002    |             | 573551002      | 573555002      |           | 573600002    | 573710002           |             |                   | 573801002     | 573929002          |
|              |             |                |                |           | 573611002    | 573712002           |             |                   | 573803002     | 573931002          |
|              |             |                |                |           | 573623002    |                     |             |                   |               |                    |
|              |             |                |                |           | 573625002    |                     |             |                   |               |                    |
|              |             |                |                |           |              |                     |             | 573724002         |               |                    |
|              |             | 573563002      |                |           | 573870002    |                     |             |                   | 573866002     |                    |
|              |             | 573860002      |                |           | 573872002    |                     |             |                   | 573868002     |                    |
|              |             |                |                |           |              |                     |             |                   |               |                    |
|              |             |                |                |           |              |                     |             |                   |               |                    |



## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-202                                                                              | Functional group name         | KEYBOARD MECHANISM |     |          |            |       |        |
|---------------|-------------------------------------------------------------------------------------|-------------------------------|--------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                                | NAME                          | Q'TY               | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                     |                               |                    |     |          | FROM       | UP TO |        |
| 1-37          |    | Keyboard Assembly             | 1                  |     |          |            |       |        |
| 1             | U51143001                                                                           | Keyboard Frame                | 1                  |     |          |            |       |        |
| 2             | U50659001                                                                           | Key Holder                    | 75                 |     |          |            |       |        |
| 3             | U50331001                                                                           | Wire Holder                   | 2                  |     |          |            |       |        |
| 4             | 539024001                                                                           | Space Key Lever               | 4                  |     |          |            |       |        |
| 5             | U50332001                                                                           | Space Wire                    | 1                  |     |          |            |       |        |
| 6             | 539012000                                                                           | Space Wire Tube               | 4                  |     |          |            |       |        |
| 7             | U50333001                                                                           | Spring                        | 2                  |     |          |            |       |        |
| 8             | 539009001                                                                           | Wire Holder                   | 2                  |     |          |            |       |        |
| 9             | 539209000                                                                           | Space Wire                    | 1                  |     |          |            |       |        |
| 10            | U50660001                                                                           | Key Holder                    | 3                  |     |          |            |       |        |
| 11            | 539218001                                                                           | Sub Stem                      | 3                  |     |          |            |       |        |
| 12            | 539211001                                                                           | Spring                        | 3                  |     |          |            |       |        |
| 13            | 539013001                                                                           | Spring                        | 6                  |     |          |            |       |        |
| 14            | U50496001                                                                           | Frame Cap                     | 1                  |     |          |            |       |        |
| 15            | U50497001                                                                           | Frame Cap                     | 1                  |     |          |            |       |        |
| 16            | U50498001                                                                           | Switch Panel                  | 1                  |     |          |            |       |        |
| 17            | U50499001                                                                           | Select Switch Key             | 4                  |     |          |            |       |        |
| 18            | 579645000                                                                           | Key Holder                    | 4                  |     |          |            |       |        |
| 19            | U50501001                                                                           | Lens Indicator                | 6                  |     |          |            |       |        |
| 20            |  | Name Plate                    | 1                  |     |          |            |       |        |
| 21            | U51039001                                                                           | Rubber Spring 26              | 1                  |     |          |            |       |        |
| 22            | U51038001                                                                           | Rubber Spring 24              | 1                  |     |          |            |       |        |
| 23            | U50634001                                                                           | Condenser Plate 1             | 33                 |     |          |            |       |        |
| 25            | U51033001                                                                           | Keyboard Circuit Board Unit   | 1                  |     |          |            |       |        |
| 26            |  | Keyboard Selection Switch     | 1                  |     |          |            |       |        |
| 27            | 575327001                                                                           | Lable for KB Selection Switch | 1                  |     |          |            |       |        |
| 28            | 062300407                                                                           | Screw for KB Selection Switch | 2                  |     |          |            |       |        |
| 29            | 575329001                                                                           | Label for Caution             | 1                  |     |          |            |       |        |
| 30            | U50581001                                                                           | Tabulation Terminal           | 2                  |     |          |            |       |        |
| 31            | 021300205                                                                           | Nut                           | 2                  |     |          |            |       |        |
| 32            | 406395001                                                                           | Tooth Washer                  | 2                  |     |          |            |       |        |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

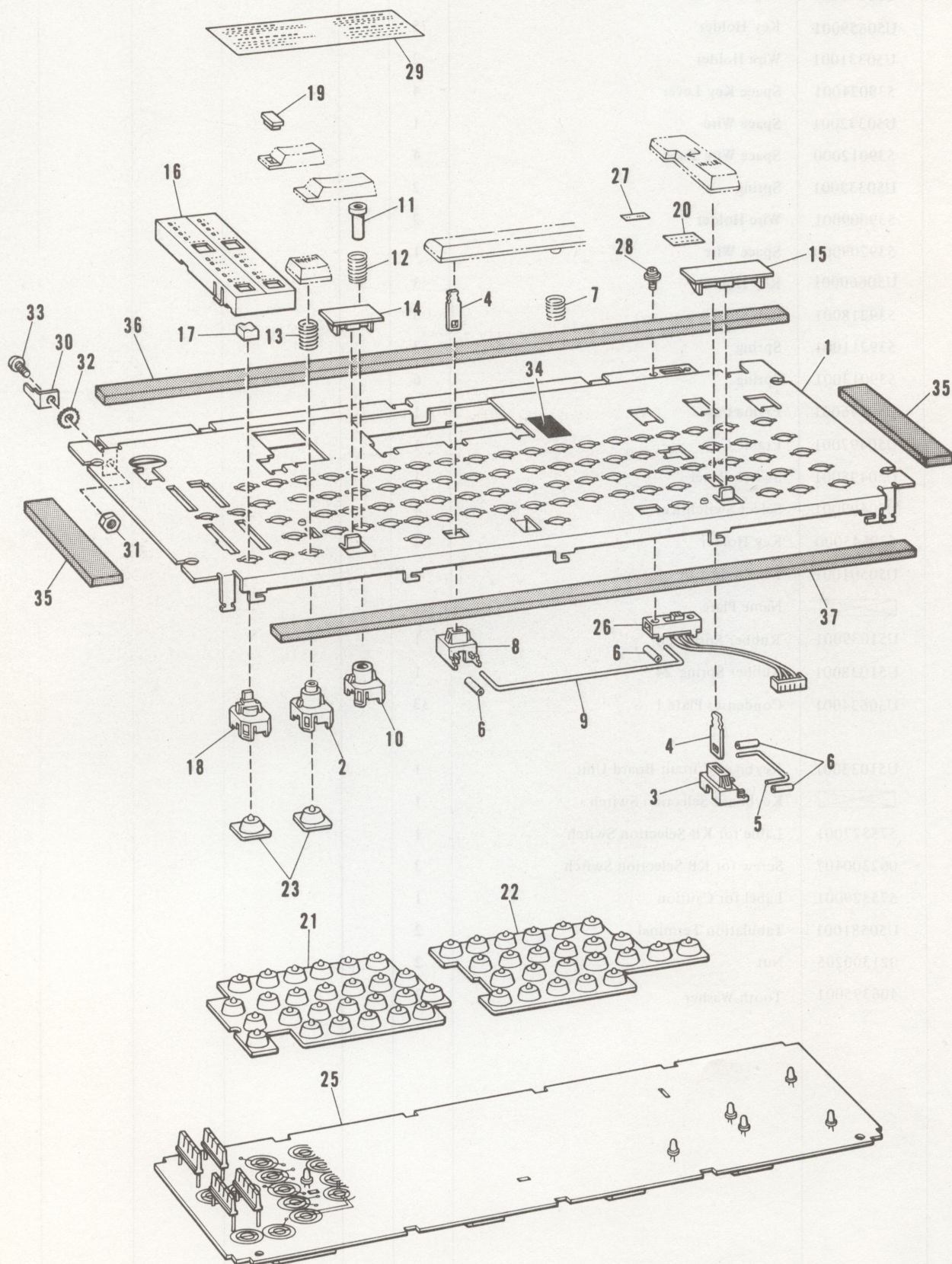
535-531-202



## KEYBOARD MECHANISM

MAIN-  
REF. NO.

TF-202





## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-202    | Functional group name   | KEYBOARD MECHANISM |     |          |            |       |        |
|---------------|-----------|-------------------------|--------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE      | NAME                    | Q'TY               | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |           |                         |                    |     |          | FROM       | UP TO |        |
| 33            | 000301005 | Screw                   | 2                  |     |          |            |       |        |
| 34            | U50000001 | Keyboard Mask 20 x 20   | 1                  |     |          |            |       |        |
| 35            | U50565001 | Keyboard Frame Sponge 1 | 2                  |     |          |            |       |        |
| 36            | U50566001 | Keyboard Frame Sponge 2 | 1                  |     |          |            |       |        |
| 37            | U50567001 | Keyboard Frame Sponge 3 | 1                  |     |          |            |       |        |

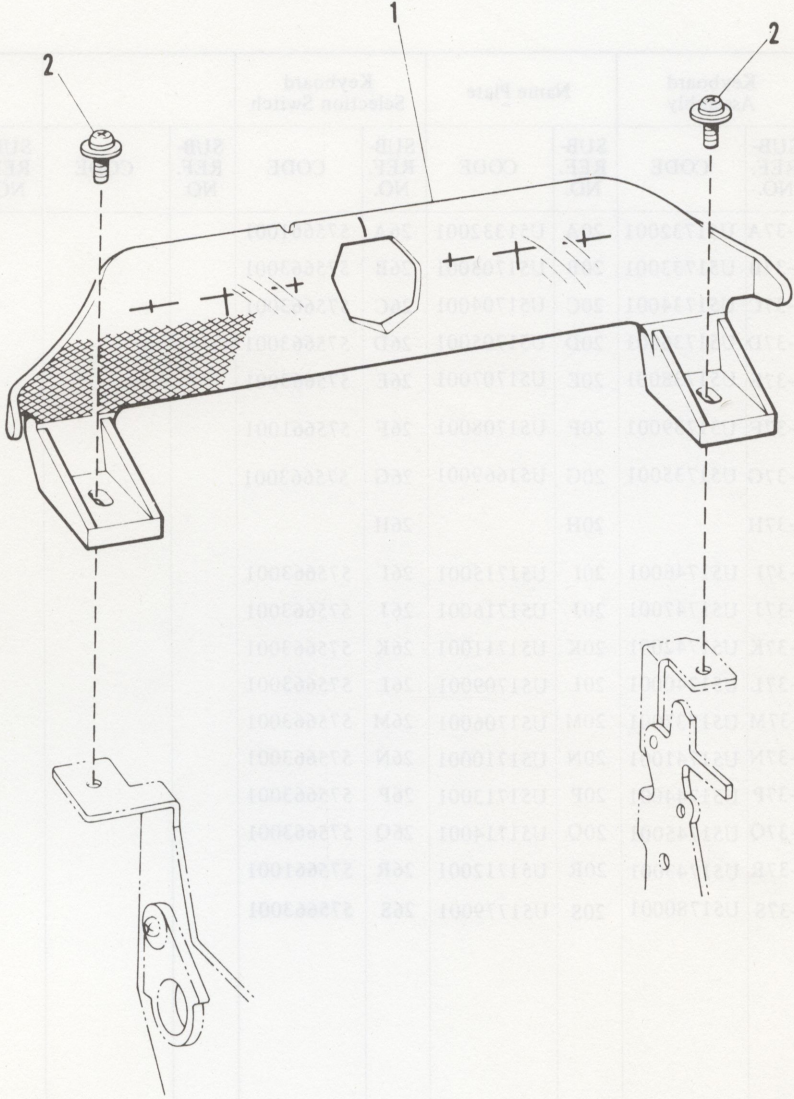
## SPECIAL PARTS

| NAME<br>COLOR & DESCRIPTION              | Keyboard Assembly |           | Name Plate   |           | Keyboard Selection Switch |           |              |      |              |      |              |      |
|------------------------------------------|-------------------|-----------|--------------|-----------|---------------------------|-----------|--------------|------|--------------|------|--------------|------|
|                                          | SUB-REF. NO.      | CODE      | SUB-REF. NO. | CODE      | SUB-REF. NO.              | CODE      | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE |
| American English                         | 1-37A             | U51732001 | 20A          | U51332001 | 26A                       | 575661001 |              |      |              |      |              |      |
| German                                   | 1-37B             | U51733001 | 20B          | U51703001 | 26B                       | 575663001 |              |      |              |      |              |      |
| King's English                           | 1-37C             | U51734001 | 20C          | U51704001 | 26C                       | 575663001 |              |      |              |      |              |      |
| French                                   | 1-37D             | U51736001 | 20D          | U51705001 | 26D                       | 575663001 |              |      |              |      |              |      |
| Dutch                                    | 1-37E             | U51738001 | 20E          | U51707001 | 26E                       | 575663001 |              |      |              |      |              |      |
| Swiss German<br>French                   | 1-37F             | U51739001 | 20F          | U51708001 | 26F                       | 575661001 |              |      |              |      |              |      |
| Bilingual                                | 1-37G             | U51735001 | 20G          | U51669001 | 26G                       | 575663001 |              |      |              |      |              |      |
| Spanish South America<br>Central America | 1-37H             |           | 20H          |           | 26H                       |           |              |      |              |      |              |      |
| Norwegian                                | 1-37I             | U51746001 | 20I          | U51715001 | 26I                       | 575663001 |              |      |              |      |              |      |
| Spanish for Spain                        | 1-37J             | U51747001 | 20J          | U51716001 | 26J                       | 575663001 |              |      |              |      |              |      |
| Italian                                  | 1-37K             | U51742001 | 20K          | U51711001 | 26K                       | 575663001 |              |      |              |      |              |      |
| Danish                                   | 1-37L             | U51740001 | 20L          | U51709001 | 26L                       | 575663001 |              |      |              |      |              |      |
| South Africa                             | 1-37M             | U51737001 | 20M          | U51706001 | 26M                       | 575663001 |              |      |              |      |              |      |
| Swedish                                  | 1-37N             | U51741001 | 20N          | U51710001 | 26N                       | 575663001 |              |      |              |      |              |      |
| Finnish                                  | 1-37P             | U51744001 | 20P          | U51713001 | 26P                       | 575663001 |              |      |              |      |              |      |
| Portuguese                               | 1-37Q             | U51745001 | 20Q          | U51714001 | 26Q                       | 575663001 |              |      |              |      |              |      |
| Latin & Greek                            | 1-37R             | U51743001 | 20R          | U51712001 | 26R                       | 575661001 |              |      |              |      |              |      |
| Turkish                                  | 1-37S             | U51780001 | 20S          | U51779001 | 26S                       | 575663001 |              |      |              |      |              |      |



PAPER METER

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-016 |
|-------------------|--------|





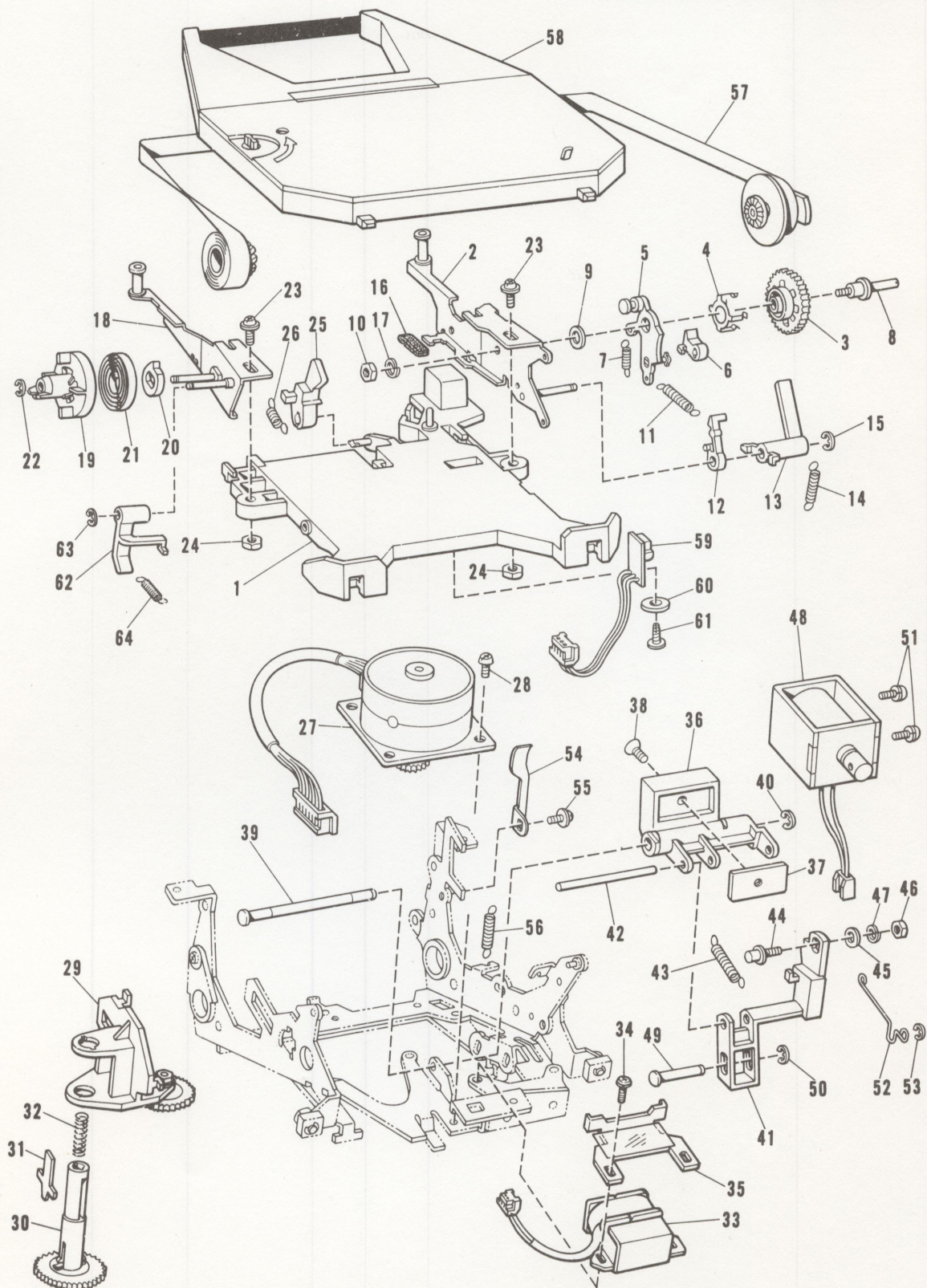




## RIBBON FEED MECHANISM

MAIN-  
REF. NO.

TF-017





## PARTS CODE &amp; PARTS NAME

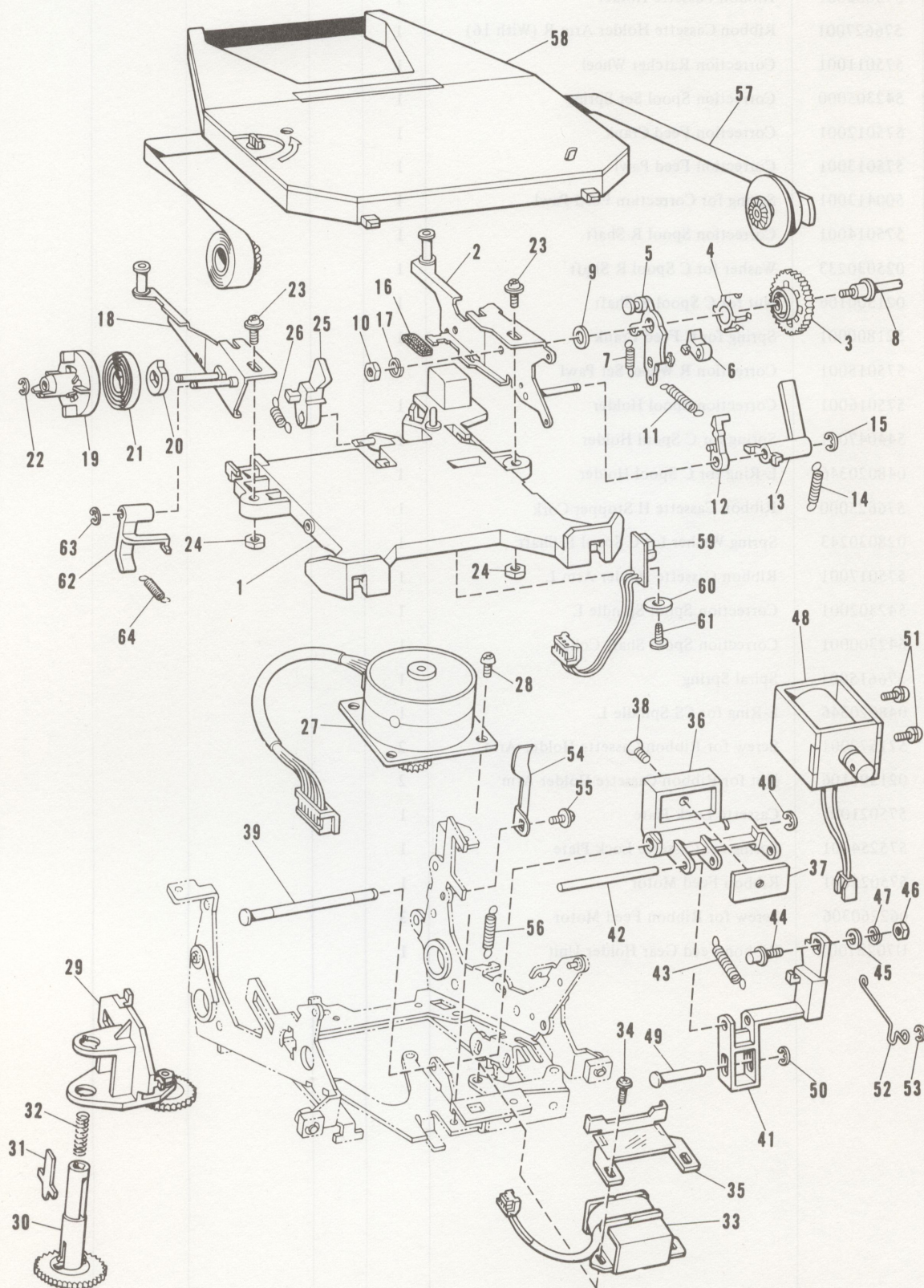
| MAIN-<br>REF. NO. | TF-017    | Functional<br>group name               | RIBBON FEED MECHANISM |     |          |            |       |        |
|-------------------|-----------|----------------------------------------|-----------------------|-----|----------|------------|-------|--------|
| SUB-<br>REF. NO.  | CODE      | NAME                                   | Q'TY                  | C/P | NEW CODE | PRODUCTION |       | REMARK |
|                   |           |                                        |                       |     |          | FROM       | UP TO |        |
| 1 – 26            | 575002001 | Ribbon Cassette Holder Unit            | 1                     |     |          |            |       |        |
| 1                 | 575003001 | Ribbon Cassette Holder                 | 1                     |     |          |            |       |        |
| 2                 | 576627001 | Ribbon Cassette Holder Arm R (With 16) | 1                     |     |          |            |       |        |
| 3                 | 575011001 | Correction Ratchet Wheel               | 1                     |     |          |            |       |        |
| 4                 | 542305000 | Correction Spool Set Spring            | 1                     |     |          |            |       |        |
| 5                 | 575012001 | Correction Feed Crank                  | 1                     |     |          |            |       |        |
| 6                 | 575013001 | Correction Feed Pawl                   | 1                     |     |          |            |       |        |
| 7                 | 500413001 | Spring for Correction Feed Pawl        | 1                     |     |          |            |       |        |
| 8                 | 575014001 | Correction Spool R Shaft               | 1                     |     |          |            |       |        |
| 9                 | 025030233 | Washer for C Spool R Shaft             | 1                     |     |          |            |       |        |
| 10                | 021300106 | Nut for C Spool R Shaft                | 1                     |     |          |            |       |        |
| 11                | 521800001 | Spring for C Feed Crank                | 1                     |     |          |            |       |        |
| 12                | 575015001 | Correction R Wheel Set Pawl            | 1                     |     |          |            |       |        |
| 13                | 575016001 | Correction Spool Holder                | 1                     |     |          |            |       |        |
| 14                | 544047001 | Spring for C Spool Holder              | 1                     |     |          |            |       |        |
| 15                | 048020346 | E-Ring for C Spool Holder              | 1                     |     |          |            |       |        |
| 16                | 576625000 | Ribbon Cassette H Stopper Cork         | 1                     |     |          |            |       |        |
| 17                | 028030243 | Spring Washer for C Spool R Shaft      | 1                     |     |          |            |       |        |
| 18                | 575017001 | Ribbon Cassette Holder Arm L           | 1                     |     |          |            |       |        |
| 19                | 542302001 | Correction Spool Spindle L             | 1                     |     |          |            |       |        |
| 20                | 542300001 | Correction Spool Shaft Collar          | 1                     |     |          |            |       |        |
| 21                | 576615001 | Spiral Spring                          | 1                     |     |          |            |       |        |
| 22                | 048020346 | E-Ring for CS Spindle L                | 1                     |     |          |            |       |        |
| 23                | 571672001 | Screw for Ribbon Cassette Holder Arm   | 2                     |     |          |            |       |        |
| 24                | 021300106 | Nut for Ribbon Cassette Holder Arm     | 2                     |     |          |            |       |        |
| 25                | 575021001 | Cassette Lock Plate                    | 1                     |     |          |            |       |        |
| 26                | 575254001 | Spring for Cassette Lock Plate         | 1                     |     |          |            |       |        |
| 27                | 575022001 | Ribbon Feed Motor                      | 1                     |     |          |            |       |        |
| 28                | 062260306 | Screw for Ribbon Feed Motor            | 3                     |     |          |            |       |        |
| 29                | U70227001 | Ribbon Feed Gear Holder Unit           | 1                     |     |          |            |       |        |



## RIBBON FEED MECHANISM

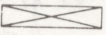
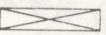
MAIN-  
REF. NO.

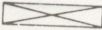
TF-017





## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-017                                                                              | Functional group name               | RIBBON FEED MECHANISM |     |          |            |       |        |
|---------------|-------------------------------------------------------------------------------------|-------------------------------------|-----------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                                | NAME                                | Q'TY                  | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                     |                                     |                       |     |          | FROM       | UP TO |        |
| 30 - 32       | 575026001                                                                           | Ribbon Feed Gear Unit               | 1                     |     |          |            |       |        |
| 30            | 575027001                                                                           | Ribbon Feed Gear                    | 1                     |     |          |            |       |        |
| 31            | 575028001                                                                           | Ribbon Feed Drive Plate             | 1                     |     |          |            |       |        |
| 32            | 575029001                                                                           | Spring for Ribbon Feed Drive Plate  | 1                     |     |          |            |       |        |
| 33            | 575031001                                                                           | Ribbon Lift Solenoid                | 1                     |     |          |            |       |        |
| 34            | 576726001                                                                           | Screw for Ribbon Lift Solenoid      | 1                     |     |          |            |       |        |
| 35            | 576530001                                                                           | Ribbon Lift Solenoid Stopper        | 1                     |     |          |            |       |        |
| 36            | 575041001                                                                           | Ribbon Lift Crank A                 | 1                     |     |          |            |       |        |
| 37            | 575043001                                                                           | Ribbon Lift Crank A Iron Core       | 1                     |     |          |            |       |        |
| 38            | 004300515                                                                           | Screw for RL Crank A Iron Core      | 1                     |     |          |            |       |        |
| 39            | 575044001                                                                           | Ribbon Lift Crank A Shaft           | 1                     |     |          |            |       |        |
| 40            | 048025346                                                                           | E-Ring for RL Crank A Shaft         | 1                     |     |          |            |       |        |
| 41            | 575045001                                                                           | Ribbon Lift Crank B                 | 1                     |     |          |            |       |        |
| 42            | 575046001                                                                           | Ribbon Lift Crank B Shaft           | 1                     |     |          |            |       |        |
| 43            | 541640001                                                                           | Spring for RL Crank B               | 1                     |     |          |            |       |        |
| 44            | 575047001                                                                           | Ribbon Lift Shaft                   | 1                     |     |          |            |       |        |
| 45            | 575048001                                                                           | Washer for Ribbon Lift Shaft        | 1                     |     |          |            |       |        |
| 46            | 021300106                                                                           | Nut for Ribbon Lift Shaft           | 1                     |     |          |            |       |        |
| 47            | 028030243                                                                           | Spring Washer for RL Shaft          | 1                     |     |          |            |       |        |
| 48            | 575049001                                                                           | Correction Solenoid                 | 1                     |     |          |            |       |        |
| 49            | 575052001                                                                           | Correction Plunger Shaft            | 1                     |     |          |            |       |        |
| 50            | 048020346                                                                           | E-Ring for Correction Plunger Shaft | 1                     |     |          |            |       |        |
| 51            | 060300405                                                                           | Screw for Correction Solenoid       | 2                     |     |          |            |       |        |
| 52            | 575053001                                                                           | Correction Feed Wire                | 1                     |     |          |            |       |        |
| 53            | 048030346                                                                           | E-Ring for Correction Feed Wire     | 1                     |     |          |            |       |        |
| 54            | 576533000                                                                           | Ribbon Lift Stopper Plate           | 1                     |     |          |            |       |        |
| 55            | 571672001                                                                           | Screw for RL Stopper Wire           | 1                     |     |          |            |       |        |
| 56            | 544781001                                                                           | Spring for Ribbon Cassette H        | 1                     |     |          |            |       |        |
| 57            |  | Correction Tape                     | 1                     |     |          |            |       |        |
| 58            |  | Cassette Ribbon                     | 1                     |     |          |            |       |        |
| 59            | 575676001                                                                           | Ribbon End Sensor                   | 1                     |     |          |            |       |        |
| 60            | 575288000                                                                           | Washer for R.E. Sensor              | 1                     |     |          |            |       |        |
| 61            | 575364001                                                                           | Screw for R.E. Sensor               | 1                     |     |          |            |       |        |
| 62            | 576630001                                                                           | Correction Spool Holder L           | 1                     |     |          |            |       |        |
| 63            | 048020346                                                                           | E-Ring for Correction S. Holder L   | 1                     |     |          |            |       |        |
| 64            | 521800001                                                                           | Spring for Correction S. Holder L   | 1                     |     |          |            |       |        |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

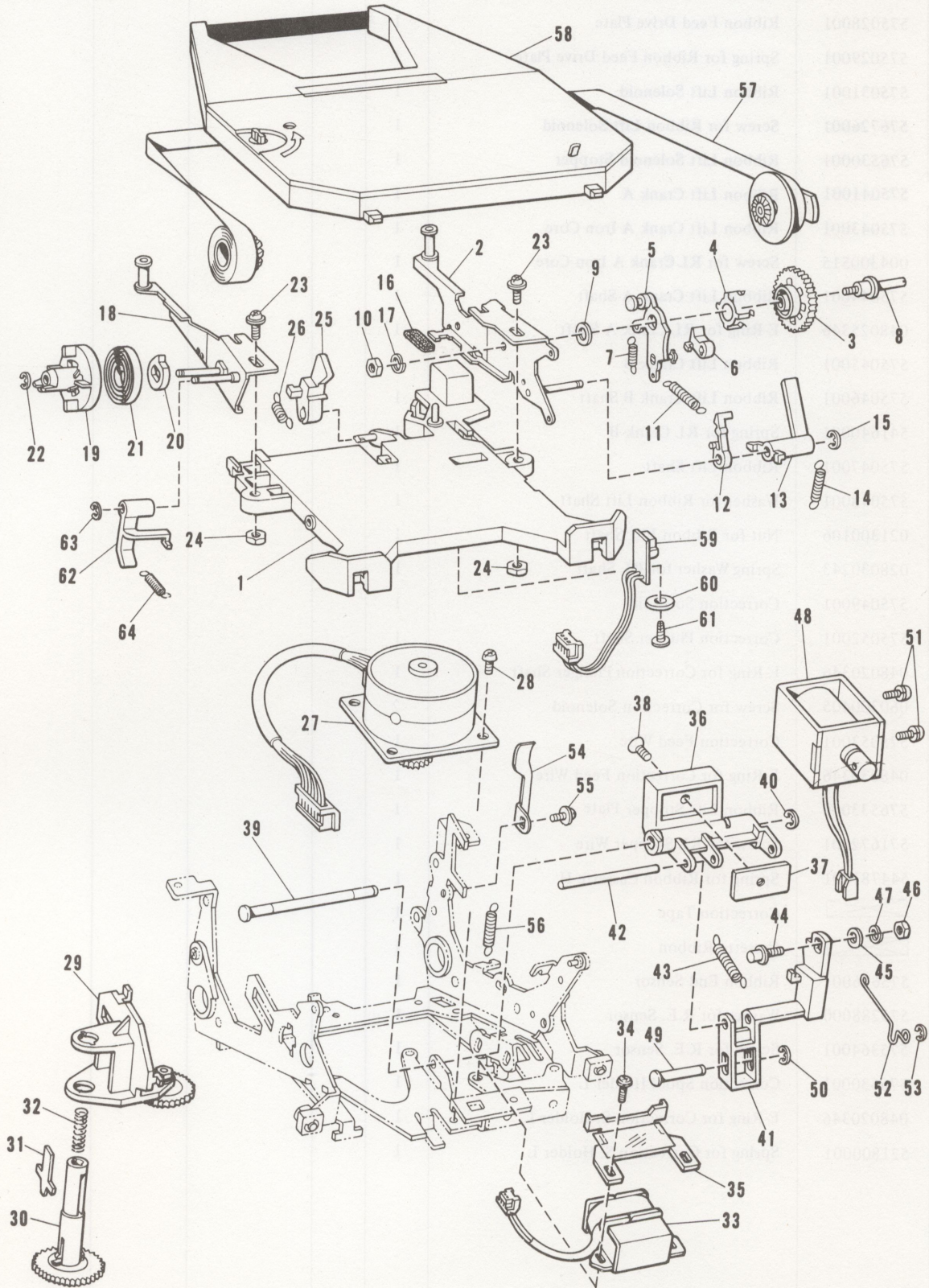
535-521-017



RIBBON FEED MECHANISM

MAIN-  
REF. NO.

TF-017





## PARTS CODE &amp; PARTS NAME

|               |        |                       |                       |
|---------------|--------|-----------------------|-----------------------|
| MAIN-REF. NO. | TF-017 | Functional group name | RIBBON FEED MECHANISM |
|---------------|--------|-----------------------|-----------------------|

## SPECIAL PARTS

| NAME<br>COLOR & DESCRIPTION | Correction Tape (Lift-off Tape) |           | Correction Tape (Cover-up Tape) |           |              |      |              |      |              |      |              |      |
|-----------------------------|---------------------------------|-----------|---------------------------------|-----------|--------------|------|--------------|------|--------------|------|--------------|------|
|                             | SUB-REF. NO.                    | CODE      | SUB-REF. NO.                    | CODE      | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE |
| Others, Europe              | 57A                             | 542543001 | 57A                             | 542804001 |              |      |              |      |              |      |              |      |
| U.S.A.                      | 57B                             | 542708001 | 57B                             | 542803001 |              |      |              |      |              |      |              |      |
| CANADA                      | 57C                             | 544784001 | 57C                             | 544788001 |              |      |              |      |              |      |              |      |

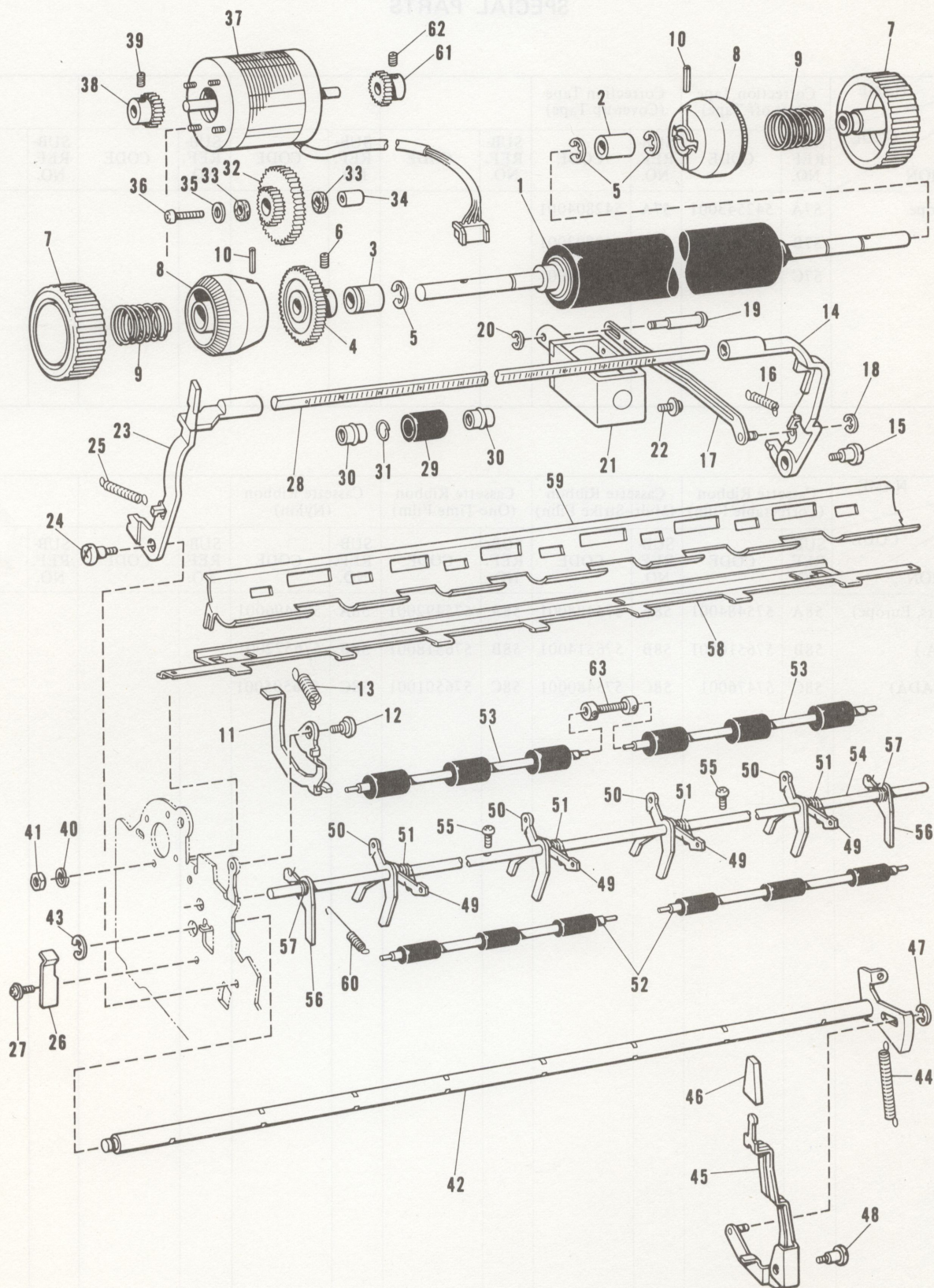
| NAME<br>COLOR & DESCRIPTION | Cassette Ribbon (Correctable Film) |           | Cassette Ribbon (Multi-Strike Film) |           | Cassette Ribbon (One-Time Film) |           | Cassette Ribbon (Nylon) |           |              |      |              |      |
|-----------------------------|------------------------------------|-----------|-------------------------------------|-----------|---------------------------------|-----------|-------------------------|-----------|--------------|------|--------------|------|
|                             | SUB-REF. NO.                       | CODE      | SUB-REF. NO.                        | CODE      | SUB-REF. NO.                    | CODE      | SUB-REF. NO.            | CODE      | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE |
| Black (Others, Europe)      | 58A                                | 575484001 | 58A                                 | 575488001 | 58A                             | 575492001 | 58A                     | 575496001 |              |      |              |      |
| Black (U.S.A.)              | 58B                                | 576510001 | 58B                                 | 576514001 | 58B                             | 576518001 | 58B                     | 576522001 |              |      |              |      |
| Black (CANADA)              | 58C                                | 57476001  | 58C                                 | 575480001 | 58C                             | 576501001 | 58C                     | 576505001 |              |      |              |      |



## PLATEN MECHANISM

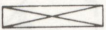
MAIN-  
REF. NO.

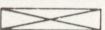
TF-031





## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-031                                                                              | Functional group name           | PLATEN MECHANISM |     |          |            |       |        |
|---------------|-------------------------------------------------------------------------------------|---------------------------------|------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                                | NAME                            | Q'TY             | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                     |                                 |                  |     |          | FROM       | UP TO |        |
| 1-10          | 575054001                                                                           | Platen Unit                     | 1                |     |          |            |       |        |
| 1             | 575055001                                                                           | Platen                          | 1                |     |          |            |       |        |
| 2             | 571940001                                                                           | Platen Bearing R                | 1                |     |          |            |       |        |
| 3             | 575059000                                                                           | Platen Bearing L                | 1                |     |          |            |       |        |
| 4             | 575060001                                                                           | Platen Gear                     | 1                |     |          |            |       |        |
| 5             | 048070346                                                                           | E-Ring for Platen Bearing RL    | 3                |     |          |            |       |        |
| 6             | 014400430                                                                           | Set Screw for Platen Gear       | 2                |     |          |            |       |        |
| 7             | 575061001                                                                           | Platen Knob                     | 2                |     |          |            |       |        |
| 8             | 575062001                                                                           | Platen Rotation Knob            | 2                |     |          |            |       |        |
| 9             | 575063001                                                                           | Compressed Spring               | 2                |     |          |            |       |        |
| 10            | 047202042                                                                           | Spring Pin                      | 2                |     |          |            |       |        |
| 11            | 575064001                                                                           | Platen Holder                   | 2                |     |          |            |       |        |
| 12            | 522542001                                                                           | Screw for Platen Holder         | 2                |     |          |            |       |        |
| 13            | 544629001                                                                           | Spring for Platen Holder        | 2                |     |          |            |       |        |
| 14            | 575066001                                                                           | Paper Bail Arm R                | 1                |     |          |            |       |        |
| 15            | 575067001                                                                           | Screw for PB Arm R              | 1                |     |          |            |       |        |
| 16            | 542936001                                                                           | Spring for PB Arm R             | 1                |     |          |            |       |        |
| 17            | 575068001                                                                           | Paper Bail Operation Bar        | 1                |     |          |            |       |        |
| 18            | 048030346                                                                           | E-Ring for PB Operation Bar     | 1                |     |          |            |       |        |
| 19            | 575072001                                                                           | Paper Bail Operation Shaft      | 1                |     |          |            |       |        |
| 20            | 048030346                                                                           | E-Ring for PB Operation Shaft   | 1                |     |          |            |       |        |
| 21            | 575073001                                                                           | Paper Bail Solenoid Unit        | 1                |     |          |            |       |        |
| 22            | 571823001                                                                           | Screw for PB Solenoid Unit      | 2                |     |          |            |       |        |
| 23            | 575074001                                                                           | Paper Bail Arm L                | 1                |     |          |            |       |        |
| 24            | 575067001                                                                           | Screw for PB Arm L              | 1                |     |          |            |       |        |
| 25            | 543298001                                                                           | Spring for PB Arm L             | 1                |     |          |            |       |        |
| 26            | 575075001                                                                           | Paper Bail Plate Spring         | 1                |     |          |            |       |        |
| 27            | 541928001                                                                           | Screw for PB Plate Spring       | 1                |     |          |            |       |        |
| 28            | 575077001                                                                           | Paper Bail Scale                | 1                |     |          |            |       |        |
| 29            | 575078001                                                                           | Paper Bail Roller               | 3                |     |          |            |       |        |
| 30            | 575079001                                                                           | Paper Bail Roller Shaft         | 6                |     |          |            |       |        |
| 31            | 575080001                                                                           | Paper Bail Roller Set Spring    | 3                |     |          |            |       |        |
| 32            |  | Line Feed Intermediate Gear     | 1                |     |          |            |       |        |
| 33            | 575082001                                                                           | LF Intermediate Gesr Felt       | 1                |     |          |            |       |        |
| 34            | 575083000                                                                           | LF Intermediate Gear Collar     | 1                |     |          |            |       |        |
| 35            | 025040333                                                                           | Washer for LF Intermediate Gear | 1                |     |          |            |       |        |
| 36            | 062401616                                                                           | Screw for LF Intermediate Gear  | 1                |     |          |            |       |        |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

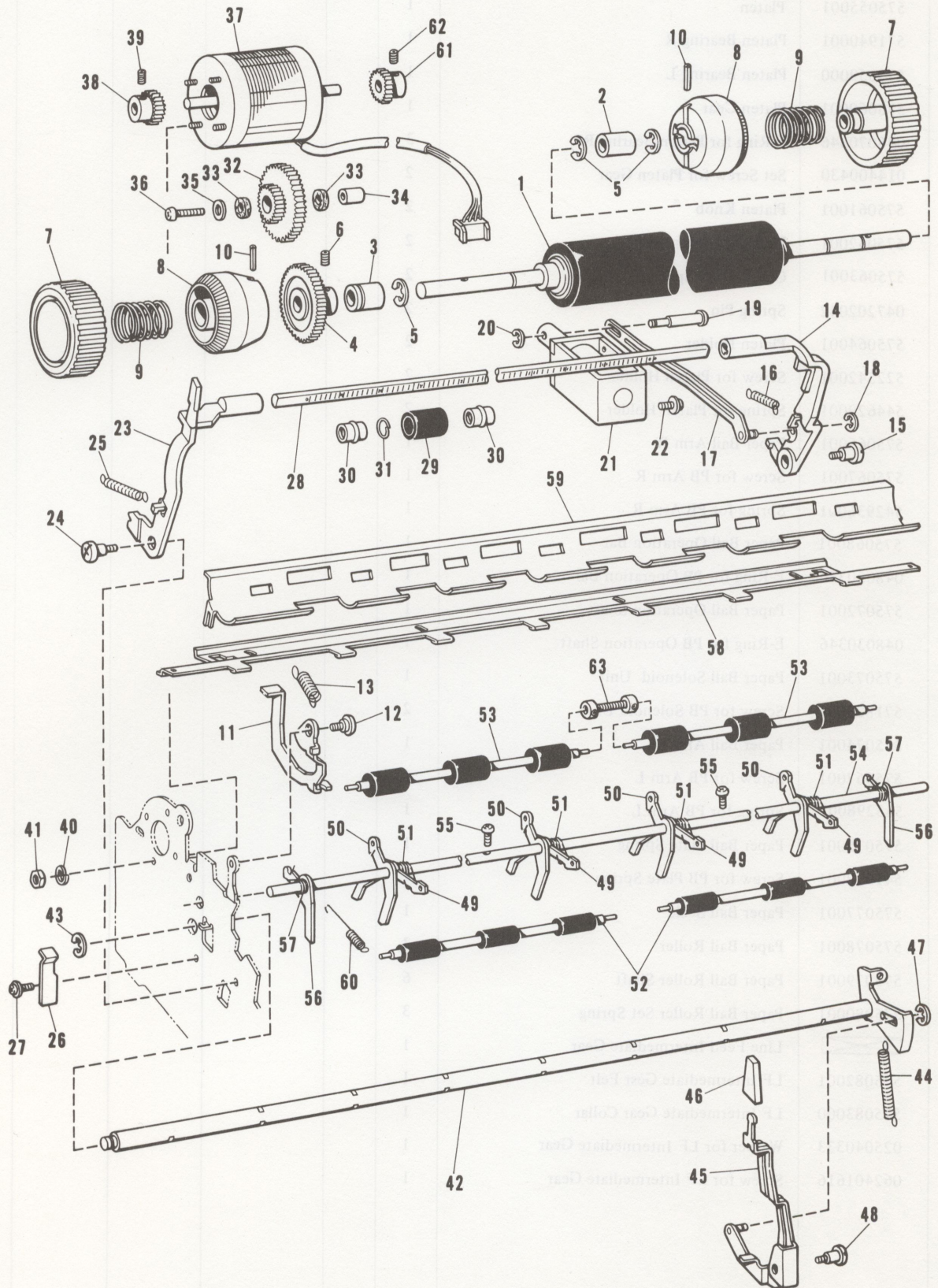
535-521-031



## PLATEN MECHANISM

MAIN-  
REF. NO.

TF-031



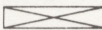


## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-031                                                                            | Functional group name            | PLATEN MECHANISM |     |          |            |       |        |
|---------------|-----------------------------------------------------------------------------------|----------------------------------|------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                             | Q'TY             | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                   |                                  |                  |     |          | FROM       | UP TO |        |
| 37            | 571353001                                                                         | Line Feed Motor                  | 1                |     |          |            |       |        |
| 38            |  | Line Feed Motor Gear             | 1                |     |          |            |       |        |
| 39            | 014400430                                                                         | Set Screw for LF Motor Gear      | 2                |     |          |            |       |        |
| 40            | 028030243                                                                         | Spring Washer for LF Motor       | 3                |     |          |            |       |        |
| 41            | 021300106                                                                         | Nut for LF Motor                 | 4                |     |          |            |       |        |
| 42            | 576301001                                                                         | Cam Shaft                        | 1                |     |          |            |       |        |
| 43            | 048060346                                                                         | E-Ring for Cam-Shaft             | 1                |     |          |            |       |        |
| 44            | 541553001                                                                         | Spring                           | 1                |     |          |            |       |        |
| 45            | 575088001                                                                         | Paper Release Lever              | 1                |     |          |            |       |        |
| 46            | 575091001                                                                         | Paper Release Lever Knob         | 1                |     |          |            |       |        |
| 47            | 048040346                                                                         | E-Ring for PR Lever              | 1                |     |          |            |       |        |
| 48            | 575092001                                                                         | Screw for PR Lever               | 1                |     |          |            |       |        |
| 49            | 575094001                                                                         | Paper Feed Roller Arm Front      | 4                |     |          |            |       |        |
| 50            | 575095001                                                                         | Paper Feed Roller Arm Rear       | 4                |     |          |            |       |        |
| 51            | 575242001                                                                         | Torsion Spring for PF Roller Arm | 4                |     |          |            |       |        |
| 52            | 571705001                                                                         | Paper Feed Roller Front          | 2                |     |          |            |       |        |
| 53            | 571708001                                                                         | Paper Feed Roller Rear           | 2                |     |          |            |       |        |
| 54            | 575096001                                                                         | Paper Feed Roller Arm Shaft      | 1                |     |          |            |       |        |
| 55            | 533413001                                                                         | Screw for PFR Arm Shaft          | 2                |     |          |            |       |        |
| 56            | 575097001                                                                         | Paper Stopper Arm                | 1                |     |          |            |       |        |
| 57            | 575243001                                                                         | Torsion Spring for PS Arm        | 2                |     |          |            |       |        |
| 58            | 575098001                                                                         | Paper Stopper                    | 1                |     |          |            |       |        |
| 59            | 575099001                                                                         | Paper Pan                        | 1                |     |          |            |       |        |
| 60            | 576554001                                                                         | Spring for PF Roller Arm Front   | 4                |     |          |            |       |        |
| 61            | 575341001                                                                         | Line Feed Motor Gear SF          | 1                |     |          |            |       |        |
| 62            | 014400430                                                                         | Set Screw for LF Motor Gear SF   | 2                |     |          |            |       |        |
| 63            | 575410001                                                                         | Paper Feed Roller Connector      | 1                |     |          |            |       |        |

## SPECIAL PARTS

| NAME<br>CODE<br>COLOR & DESCRIPTION | Line Feed Inter-mediate Gear |           | Line Feed Motor Gear |           |              |      |              |      |              |      |              |      |
|-------------------------------------|------------------------------|-----------|----------------------|-----------|--------------|------|--------------|------|--------------|------|--------------|------|
|                                     | SUB-REF. NO.                 | CODE      | SUB-REF. NO.         | CODE      | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE |
| Italy only                          | 32A                          | 575370001 | 38A                  | 575371001 |              |      |              |      |              |      |              |      |
| Others                              | 32B                          | 575081001 | 38B                  | 575084001 |              |      |              |      |              |      |              |      |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

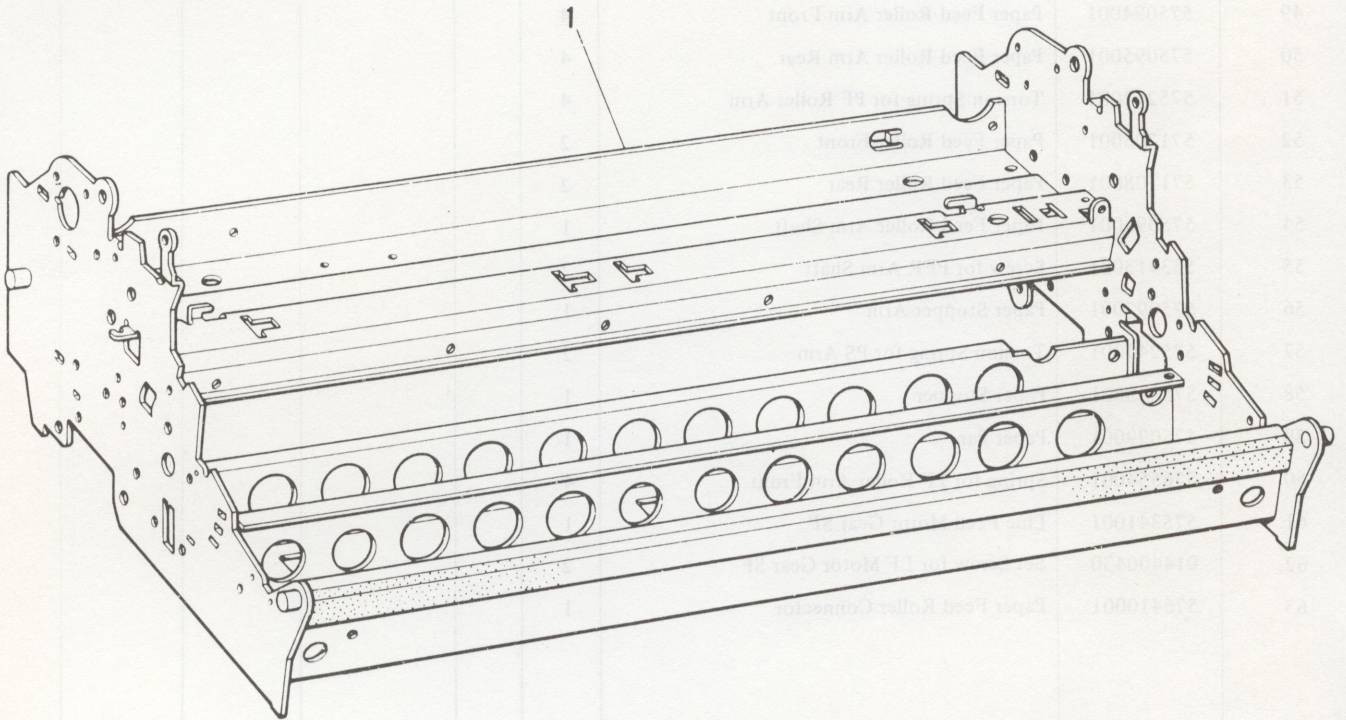
535-521-031



CHASSIS

MAIN-  
REF. NO.

TF-033



SPECIAL PARTS

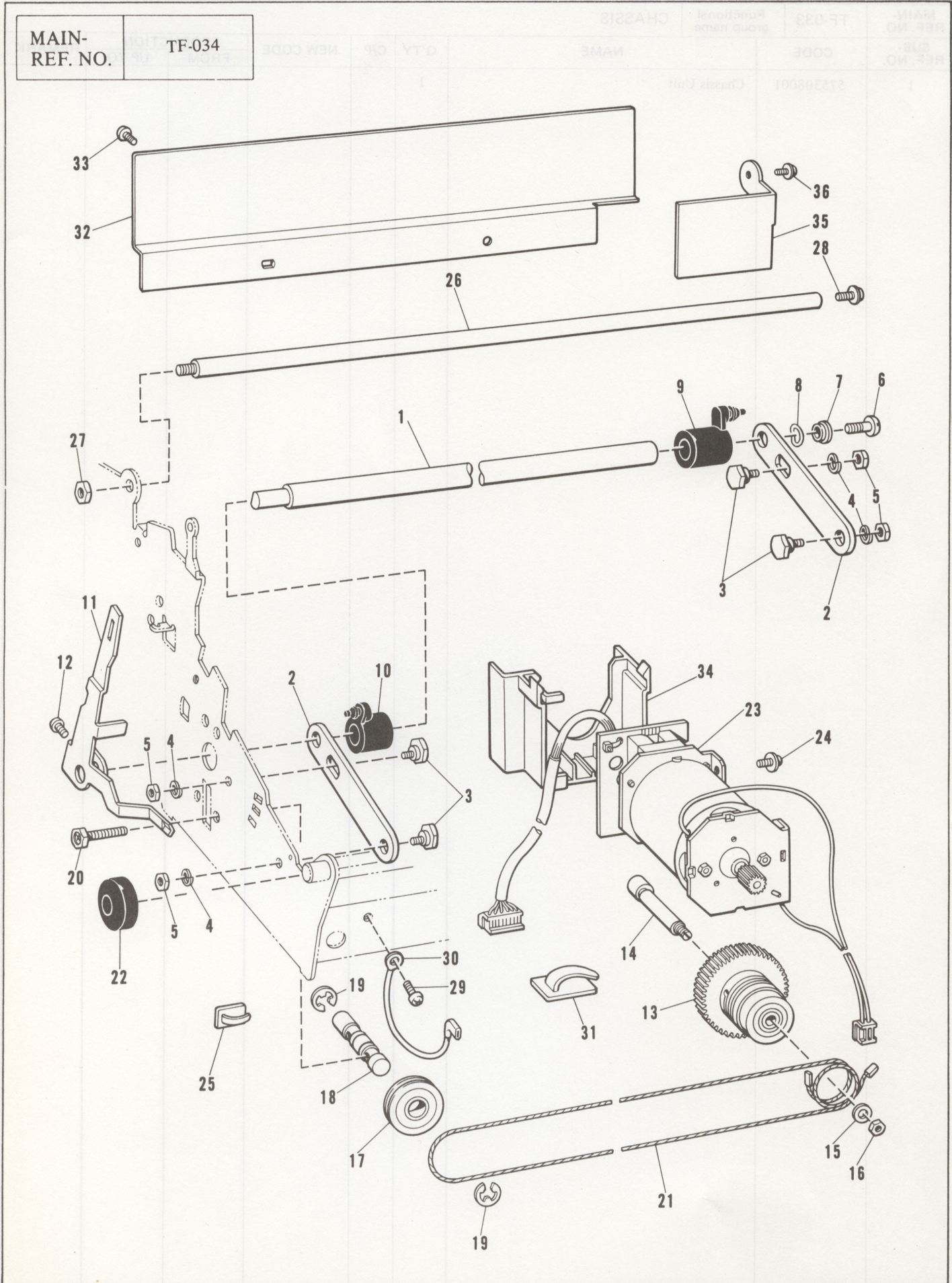


PARTS CODE & PARTS NAME

| MAIN-REF. NO. | TF-033    | Functional group name | CHASSIS |     |          |            |       |        |
|---------------|-----------|-----------------------|---------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE      | NAME                  | Q'TY    | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |           |                       |         |     |          | FROM       | UP TO |        |
| 1             | 575308001 | Chassis Unit          | 1       |     |          |            |       |        |



CHASSIS ATTACHMENT





## PARTS CODE &amp; PARTS NAME

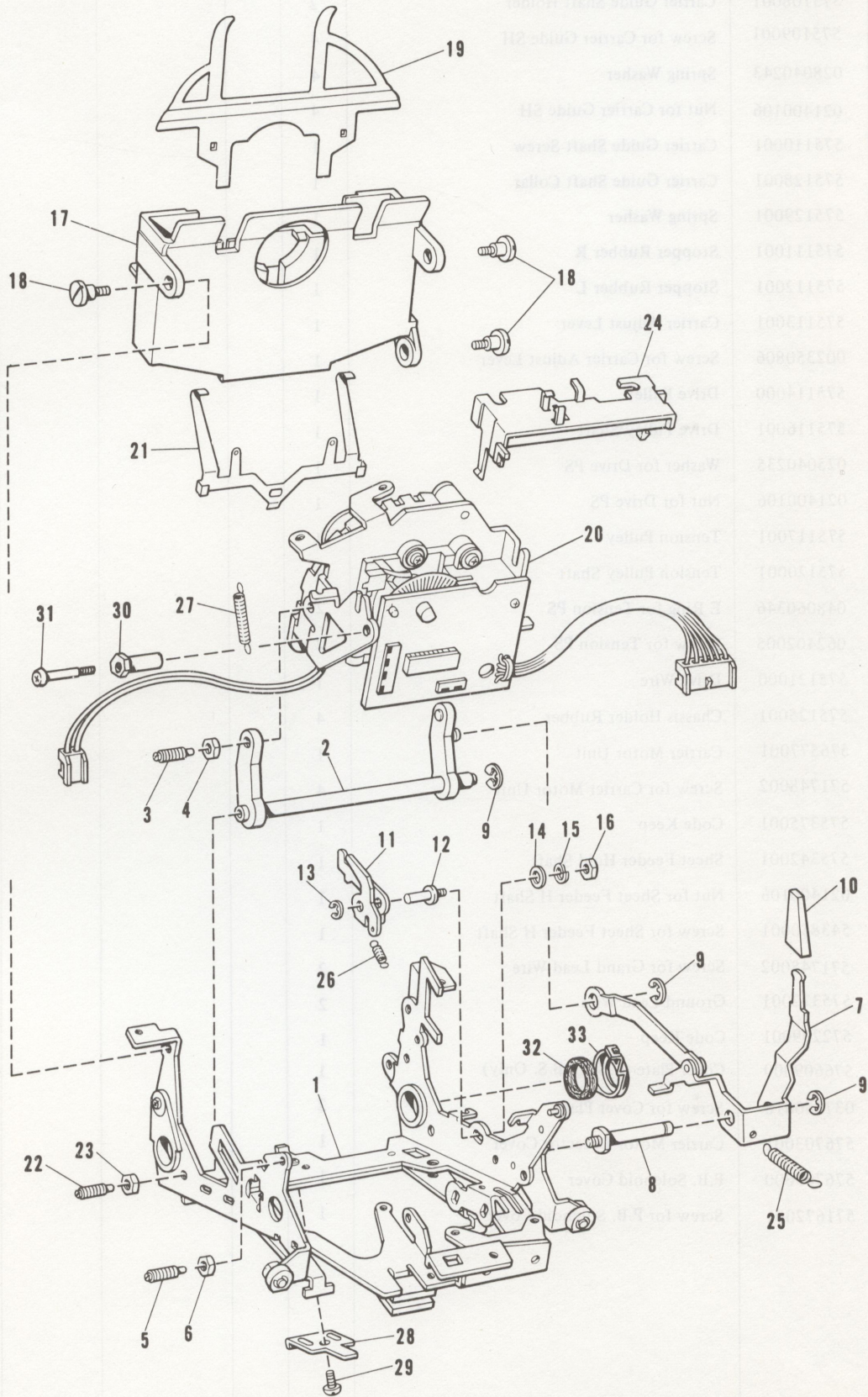
| MAIN-REF. NO. | TF-034    | Functional group name           | CHASSIS ATTACHMENT |     |          |            |       |        |
|---------------|-----------|---------------------------------|--------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE      | NAME                            | Q'TY               | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |           |                                 |                    |     |          | FROM       | UP TO |        |
| 1             | 575107001 | Carrier Guide Shaft             | 1                  |     |          |            |       |        |
| 2             | 575108001 | Carrier Guide Shaft Holder      | 2                  |     |          |            |       |        |
| 3             | 575109001 | Screw for Carrier Guide SH      | 4                  |     |          |            |       |        |
| 4             | 028040243 | Spring Washer                   | 4                  |     |          |            |       |        |
| 5             | 021400106 | Nut for Carrier Guide SH        | 4                  |     |          |            |       |        |
| 6             | 575110001 | Carrier Guide Shaft Screw       | 1                  |     |          |            |       |        |
| 7             | 575128001 | Carrier Guide Shaft Collar      | 1                  |     |          |            |       |        |
| 8             | 575129001 | Spring Washer                   | 1                  |     |          |            |       |        |
| 9             | 575111001 | Stopper Rubber R                | 1                  |     |          |            |       |        |
| 10            | 575112001 | Stopper Rubber L                | 1                  |     |          |            |       |        |
| 11            | 575113001 | Carrier Adjust Lever            | 1                  |     |          |            |       |        |
| 12            | 002350806 | Screw for Carrier Adjust Lever  | 1                  |     |          |            |       |        |
| 13            | 575114000 | Drive Pulley                    | 1                  |     |          |            |       |        |
| 14            | 575116001 | Drive Pulley Shaft              | 1                  |     |          |            |       |        |
| 15            | 025040235 | Washer for Drive PS             | 1                  |     |          |            |       |        |
| 16            | 021400106 | Nut for Drive PS                | 1                  |     |          |            |       |        |
| 17            | 575117001 | Tension Pulley                  | 1                  |     |          |            |       |        |
| 18            | 575120001 | Tension Pulley Shaft            | 1                  |     |          |            |       |        |
| 19            | 048060346 | E Ring for Tension PS           | 2                  |     |          |            |       |        |
| 20            | 062402005 | Screw for Tension PS            | 2                  |     |          |            |       |        |
| 21            | 575121000 | Drive Wire                      | 1                  |     |          |            |       |        |
| 22            | 575125001 | Chassis Holder Rubber           | 4                  |     |          |            |       |        |
| 23            | 576577001 | Carrier Motor Unit              | 1                  |     |          |            |       |        |
| 24            | 571748002 | Screw for Carrier Motor Unit    | 4                  |     |          |            |       |        |
| 25            | 575375001 | Code Keep                       | 1                  |     |          |            |       |        |
| 26            | 575342001 | Sheet Feeder Hold Shaft         | 1                  |     |          |            |       |        |
| 27            | 021400106 | Nut for Sheet Feeder H Shaft    | 1                  |     |          |            |       |        |
| 28            | 543850001 | Screw for Sheet Feeder H Shaft  | 1                  |     |          |            |       |        |
| 29            | 571748002 | Screw for Grand Lead Wire       | 2                  |     |          |            |       |        |
| 30            | 575372001 | Ground Lead Wire                | 2                  |     |          |            |       |        |
| 31            | 572299001 | Code Keep                       | 1                  |     |          |            |       |        |
| 32            | 576609000 | Cover Plate (C.S.A., B.S. Only) | 1                  |     |          |            |       |        |
| 33            | 037350616 | Screw for Cover Plate           | 2                  |     |          |            |       |        |
| 34            | 576703001 | Carrier Motor Detector Cover    | 1                  |     |          |            |       |        |
| 35            | 576705000 | P.B. Solenoid Cover             | 1                  |     |          |            |       |        |
| 36            | 571672001 | Screw for P.B. Solenoid Cover   | 1                  |     |          |            |       |        |



CARRIER MECHANISM

MAIN-  
REF. NO.

TF-043





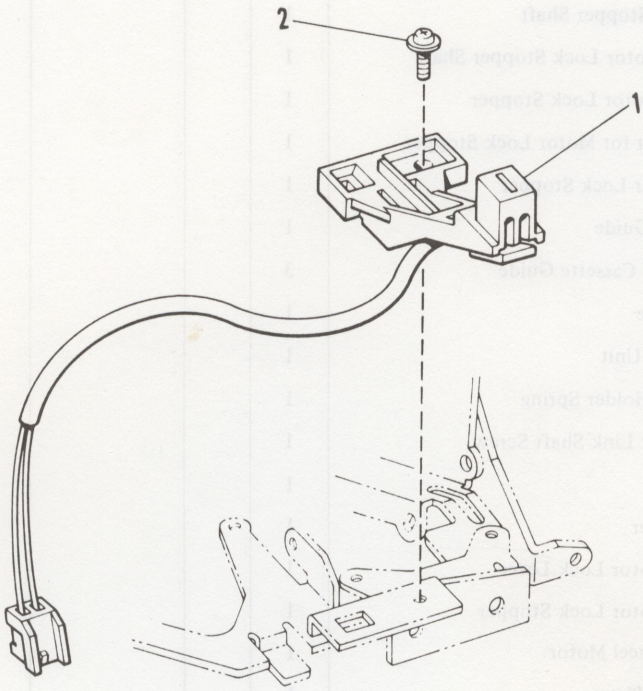
## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-043    | Functional group name                | CARRIER MECHANISM |     |          |            |       |        |
|---------------|-----------|--------------------------------------|-------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE      | NAME                                 | Q'TY              | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |           |                                      |                   |     |          | FROM       | UP TO |        |
| 1             | 575130001 | Carrier Body Unit                    | 1                 |     |          |            |       |        |
| 2             | 575141001 | Motor Holder Link Unit               | 1                 |     |          |            |       |        |
| 3             | 575147001 | Wheel Motor Shaft Screw              | 1                 |     |          |            |       |        |
| 4             | 021400106 | Nut                                  | 1                 |     |          |            |       |        |
| 5             | 575148001 | Ribbon Cassette Holder Shaft Screw   | 1                 |     |          |            |       |        |
| 6             | 021300106 | Nut                                  | 1                 |     |          |            |       |        |
| 7             | 575149001 | Motor Lock Lever                     | 1                 |     |          |            |       |        |
| 8             | 575153001 | Motor Lock Lever Shaft               | 1                 |     |          |            |       |        |
| 9             | 048040346 | E-Ring                               | 2                 |     |          |            |       |        |
| 10            | 575091002 | Motor Lock Lever Knob                | 1                 |     |          |            |       |        |
| 11            | 575154001 | Motor Lock Stopper                   | 1                 |     |          |            |       |        |
| 12            | 575155001 | Motor Lock Stopper Shaft             | 1                 |     |          |            |       |        |
| 13            | 048025346 | E-Ring for Motor Lock Stopper Shaft  | 1                 |     |          |            |       |        |
| 14            | 025350136 | Washer for Motor Lock Stopper        | 1                 |     |          |            |       |        |
| 15            | 028350243 | Spring Washer for Motor Lock Stopper | 1                 |     |          |            |       |        |
| 16            | 021350106 | Nut for Motor Lock Stopper           | 1                 |     |          |            |       |        |
| 17            | 575156001 | PW Cassette Guide                    | 1                 |     |          |            |       |        |
| 18            | 575157001 | Screw for PW Cassette Guide          | 3                 |     |          |            |       |        |
| 19            | 575158000 | Ribbon Guide                         | 1                 |     |          |            |       |        |
| 20            | U71373001 | Wheel Motor Unit                     | 1                 |     |          |            |       |        |
| 21            | 575161000 | PW Cassette Holder Spring            | 1                 |     |          |            |       |        |
| 22            | 575147001 | Motor Holder Link Shaft Screw        | 1                 |     |          |            |       |        |
| 23            | 021400106 | Nut                                  | 1                 |     |          |            |       |        |
| 24            | 576600001 | Encoder Cover                        | 1                 |     |          |            |       |        |
| 25            | 522528001 | Spring for Motor Lock Lever          | 1                 |     |          |            |       |        |
| 26            | 500284001 | Spring for Motor Lock Stopper        | 1                 |     |          |            |       |        |
| 27            | 576851001 | Spring for Wheel Motor               | 1                 |     |          |            |       |        |
| 28            | 575126001 | Rope Holder Plate                    | 1                 |     |          |            |       |        |
| 29            | 062350605 | Screw for Rope Holder Plate          | 1                 |     |          |            |       |        |
| 30            | 576697001 | Eccentric Collar                     | 1                 |     |          |            |       |        |
| 31            | 576698001 | Shaft Screw                          | 1                 |     |          |            |       |        |
| 32            | U70019000 | Felt                                 | 1                 |     |          |            |       |        |
| 33            | U70018001 | Carrier Guide Cap                    | 1                 |     |          |            |       |        |



CARRIER ATTACHMENT

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-044 |
|-------------------|--------|





## PARTS CODE &amp; PARTS NAME

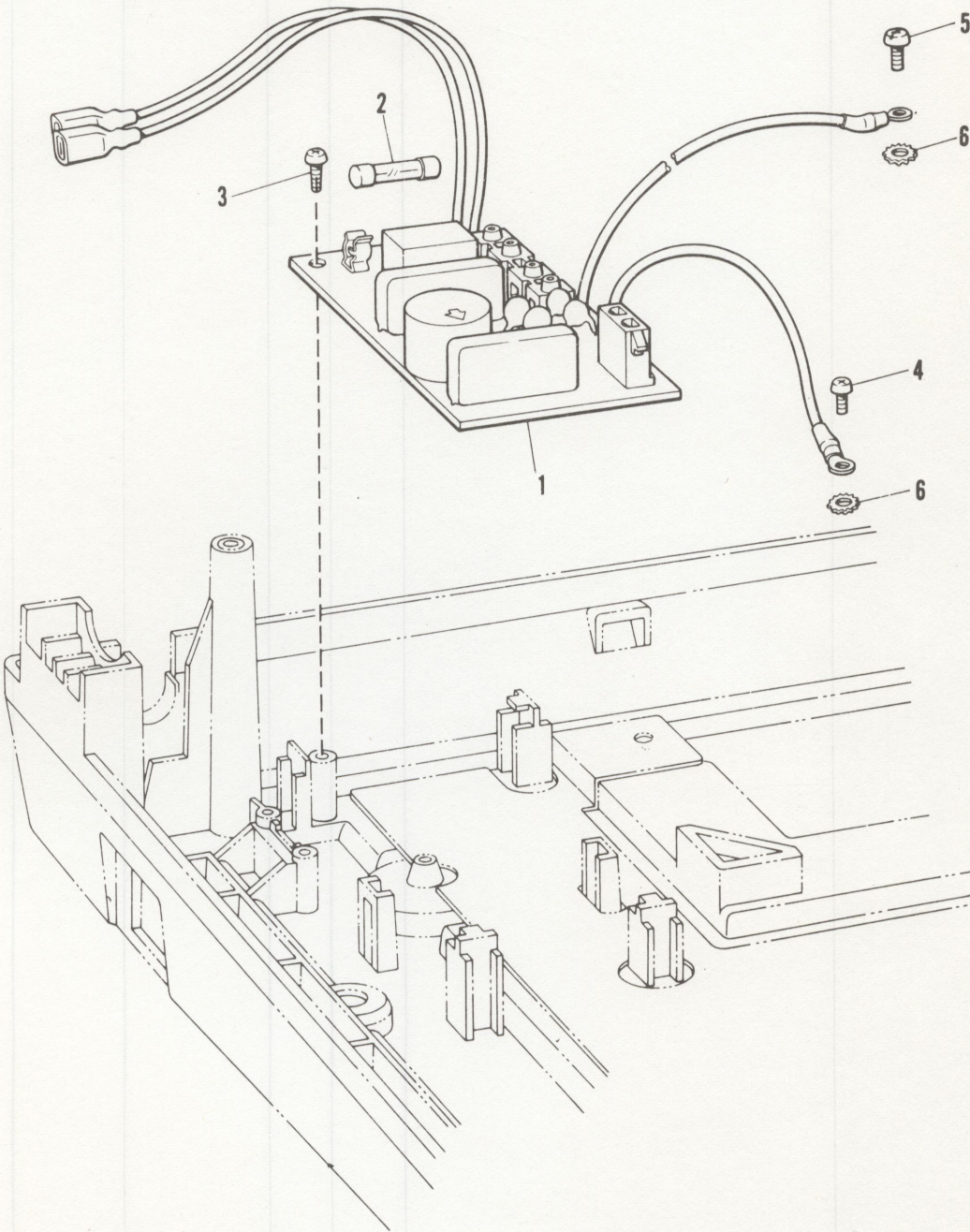
| MAIN-REF. NO. | TF-044    | Functional group name         | CARRIER ATTACHMENT |     |          |            |       |        |
|---------------|-----------|-------------------------------|--------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE      | NAME                          | Q'TY               | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |           |                               |                    |     |          | FROM       | UP TO |        |
| 1             | 575163001 | Head Indication Unit          | 1                  |     |          |            |       |        |
| 2             | 571672001 | Screw for Head Indicator Unit | 1                  |     |          |            |       |        |



3M FILTER CIRCUIT BOARD

MAIN-  
REF. NO.

TF-050



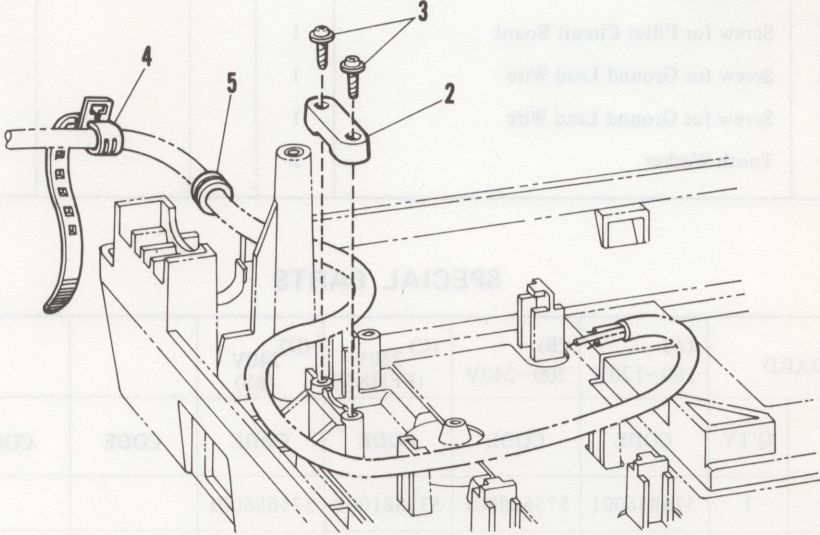






POWER SUPPLY CORD

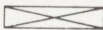
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|-------------------|--------|
| MAIN-<br>REF. NO. | TF-051 |
|-------------------|--------|



|    |  |    |  |
|----|--|----|--|
| 1A |  | 1J |  |
| 1B |  | 1K |  |
| 1C |  | 1L |  |
| 1D |  | 1M |  |
| 1E |  | 1N |  |
| 1F |  |    |  |
| 1G |  |    |  |

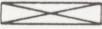


## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-051                                                                            | Functional group name         | POWER SUPPLY CORD |     |          |            |       |        |
|---------------|-----------------------------------------------------------------------------------|-------------------------------|-------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                          | Q'TY              | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                   |                               |                   |     |          | FROM       | UP TO |        |
| 1             |  | Power Supply Cord (with 4, 5) | 1                 |     |          |            |       |        |
| 2             | 571969000                                                                         | Cord Holder                   | 1                 |     |          |            |       |        |
| 3             | 575363001                                                                         | Screw for Cord Holder         | 2                 |     |          |            |       |        |
| 4             | 516646000                                                                         | Cord Binder                   | 1                 |     |          |            |       |        |
| 5             | 571853001                                                                         | Cord Bush                     | 1                 |     |          |            |       |        |
| 6             | 214953000                                                                         | Label for BS Cord             | 1                 |     |          |            |       |        |
| 7             | 062350605                                                                         | Screw (C.S.A. only)           | 1                 |     |          |            |       |        |
| 8             | 502673001                                                                         | Tooth Washer (C.S.A. only)    | 1                 |     |          |            |       |        |

## SPECIAL PARTS

| NAME<br>COLOR & DESCRIPTION | Power Supply Cord |              |      |              |      |              |      |              |
|-----------------------------|-------------------|--------------|------|--------------|------|--------------|------|--------------|
|                             | CODE              | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. |
| UL, CSA/Others              | 1A                | 575169001    |      |              |      |              |      |              |
| VDE (GERMANY)               | 1B                | 575171001    |      |              |      |              |      |              |
| BS (ENGLAND)                | 1C                | 575313001    |      |              |      |              |      |              |
| SEV (SWISS)                 | 1D                | 575332001    |      |              |      |              |      |              |
| USE (FRANCE)                | 1E                | 575315001    |      |              |      |              |      |              |
| (EUROPE-B)                  | 1F                | 575317001    |      |              |      |              |      |              |
| (EUROPE-C)                  | 1G                | 575334001    |      |              |      |              |      |              |
| AUSTRALIA                   | 1J                | 575320001    |      |              |      |              |      |              |
|                             | 1K                |              |      |              |      |              |      |              |
| DEMKO (DENMARK)             | 1L                | 575336001    |      |              |      |              |      |              |
| ARGENTINE/Others            | 1M                | 575338001    |      |              |      |              |      |              |
| CSA (CANADA)                | 1N                | 576621001    |      |              |      |              |      |              |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

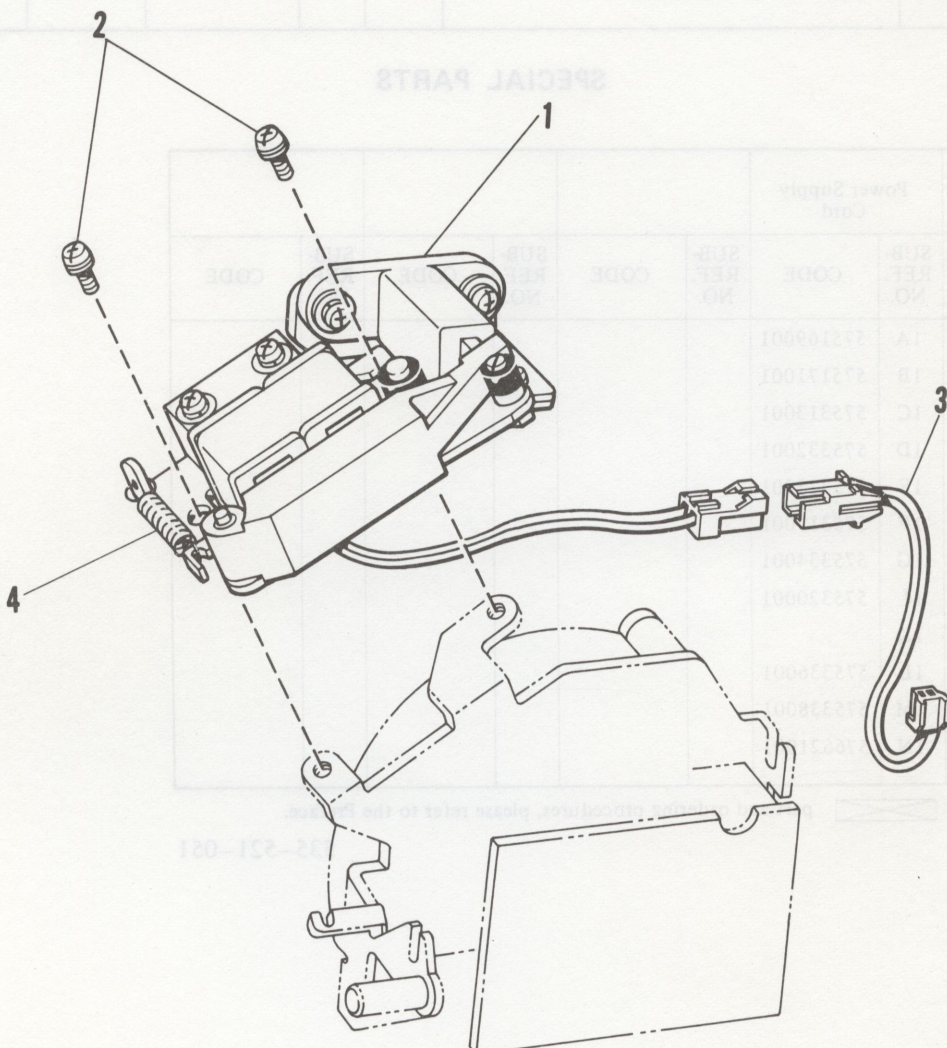
535-521-051



HAMMER SOLENOID

MAIN-  
REF. NO.

TF-055



SPECIAL PARTS

| DESCRIPTION           | CODE     | REF. NO. | NAME                       |
|-----------------------|----------|----------|----------------------------|
| Power Supply Cord     | 27333000 | 1        | Power Supply Cord (with 2) |
| Cord Holder           | 27333001 | 2        | Cord Holder                |
| Screw for Cord Holder | 27333001 | 3        | Screw for Cord Holder      |
| Cord Holder           | 27333001 | 4        | Cord Holder                |
| Cord Holder           | 27333001 | 5        | Cord Holder                |
| Cord Holder           | 27333001 | 6        | Cord Holder                |
| Cord Holder           | 27333001 | 7        | Cord Holder                |
| Cord Holder           | 27333001 | 8        | Cord Holder                |



PARTS CODE & PARTS NAME

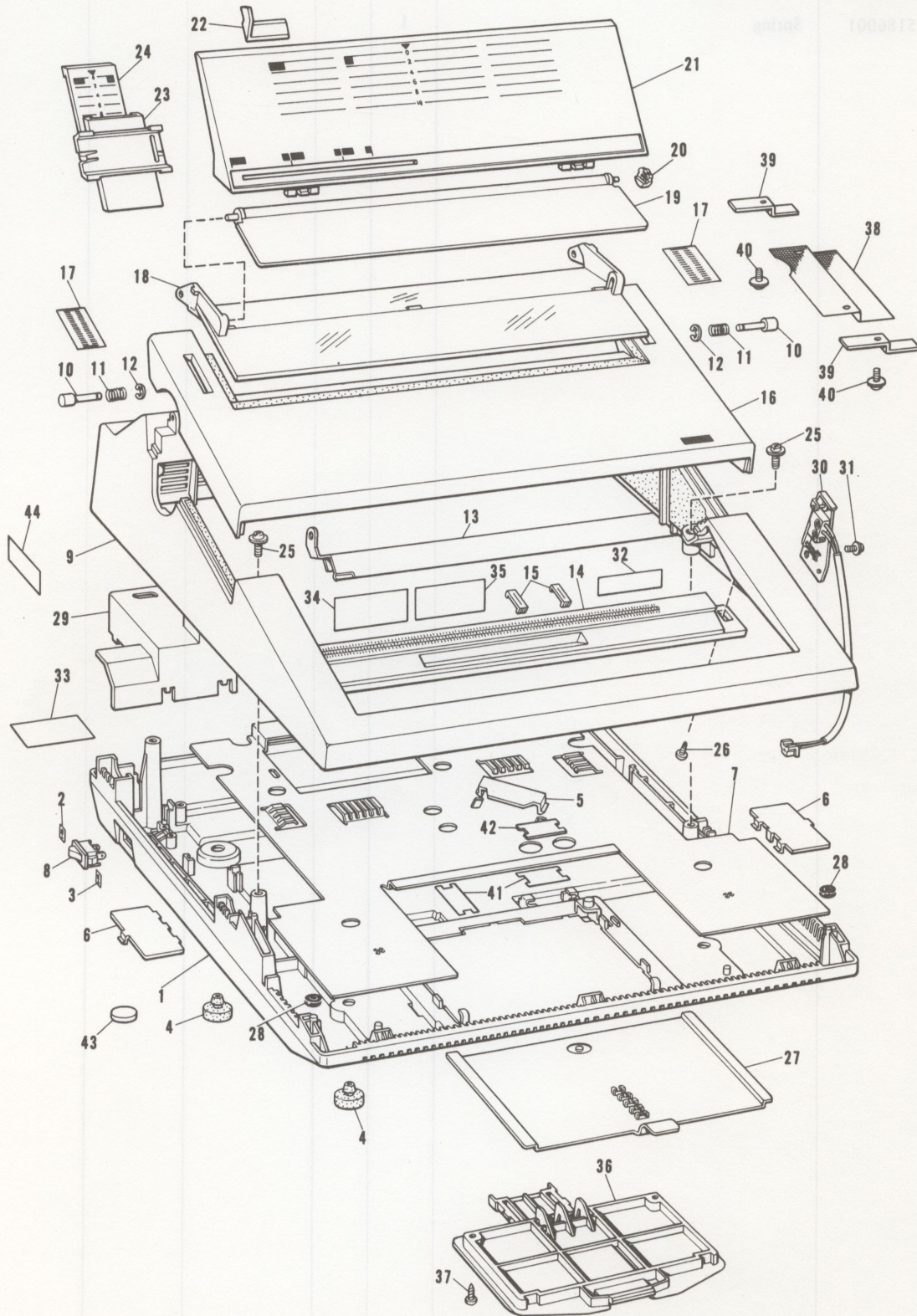
| MAIN-REF. NO. | TF-055    | Functional group name          | HAMMER SOLENOID |     |          |            |       |        |
|---------------|-----------|--------------------------------|-----------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE      | NAME                           | Q'TY            | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |           |                                |                 |     |          | FROM       | UP TO |        |
| 1             | U71257001 | Hammer Solenoid Unit           | 1               |     |          |            |       |        |
| 2             | 575039003 | Screw for Hammer Solenoid Unit | 2               |     |          |            |       |        |
| 3             | 576874001 | Relay Harness                  | 1               |     |          |            |       |        |
| 4             | 575186001 | Spring                         | 1               |     |          |            |       |        |



## COVER

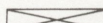
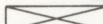
MAIN-  
REF. NO.

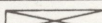
TF-061





## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-061                                                                              | Functional group name            | COVER |     |          |            |       |        |
|---------------|-------------------------------------------------------------------------------------|----------------------------------|-------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                                | NAME                             | Q'TY  | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                     |                                  |       |     |          | FROM       | UP TO |        |
| 1             |    | Lower Cover Unit (with 2-4, 7)   | 1     |     |          |            |       |        |
| 2             | 575325001                                                                           | Switch Indicator ON              | 1     |     |          |            |       |        |
| 3             | 575326001                                                                           | Switch Indicator OFF             | 1     |     |          |            |       |        |
| 4             | 575201001                                                                           | Rubber Foot                      | 4     |     |          |            |       |        |
| 5             | 575199001                                                                           | Flat Cable Holder                | 1     |     |          |            |       |        |
| 6             | 575200001                                                                           | Wire Harness Holder              | 2     |     |          |            |       |        |
| 7             |    | Lower Cover Plate                | 1     |     |          |            |       |        |
| 8             | 575198001                                                                           | ON/OFF Switch                    | 1     |     |          |            |       |        |
| 9             |    | Upper Cover Unit (with 10-12)    | 1     |     |          |            |       |        |
| 10            | 575208001                                                                           | Top Cover Shaft                  | 2     |     |          |            |       |        |
| 11            | 575249001                                                                           | Spring for Top Cover Shaft       | 2     |     |          |            |       |        |
| 12            | 048020346                                                                           | E-Ring for Top Cover Shaft       | 2     |     |          |            |       |        |
| 13            | 575209001                                                                           | Paper Rest                       | 1     |     |          |            |       |        |
| 14            | 575212001                                                                           | Margin Scale Base Unit (with 15) | 1     |     |          |            |       |        |
| 15            | 575215001                                                                           | Margin Scale Cursor              | 2     |     |          |            |       |        |
| 16            |    | Top Cover Unit                   | 1     |     |          |            |       |        |
| 17            | U71278001                                                                           | Cover Blind PR                   | 2     |     |          |            |       |        |
| 18-20         | 575220001                                                                           | Acoustic Cover Unit              | 1     |     |          |            |       |        |
| 18            | 575221001                                                                           | Acoustic Cover                   | 1     |     |          |            |       |        |
| 19            | 575222001                                                                           | Blinder                          | 1     |     |          |            |       |        |
| 20            | 576722001                                                                           | Blinder Collar                   | 1     |     |          |            |       |        |
| 21-24         | 575223001                                                                           | Paper Supporter Unit             | 1     |     |          |            |       |        |
| 21            | 575224001                                                                           | Paper Supporter                  | 1     |     |          |            |       |        |
| 22            | 575225001                                                                           | Paper Guide                      | 1     |     |          |            |       |        |
| 23            | 573114001                                                                           | PE Indicator Holder              | 1     |     |          |            |       |        |
| 24            | 575226001                                                                           | PE Indicator                     | 1     |     |          |            |       |        |
| 25            | 519483001                                                                           | Screw for Upper Cover            | 4     |     |          |            |       |        |
| 26            | 575362001                                                                           | Screw for Margin Scale Base      | 2     |     |          |            |       |        |
| 27            | 575228001                                                                           | Manual Tray                      | 1     |     |          |            |       |        |
| 28            | 575230001                                                                           | Key Board Holder Rubber          | 4     |     |          |            |       |        |
| 29            |  | Filter Circuit Board Cover       | 1     |     |          |            |       |        |
| 30            | 576694001                                                                           | Cover Switch Unit                | 1     |     |          |            |       |        |
| 31            | 571672001                                                                           | Screw for Cover Switch Holder    | 1     |     |          |            |       |        |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

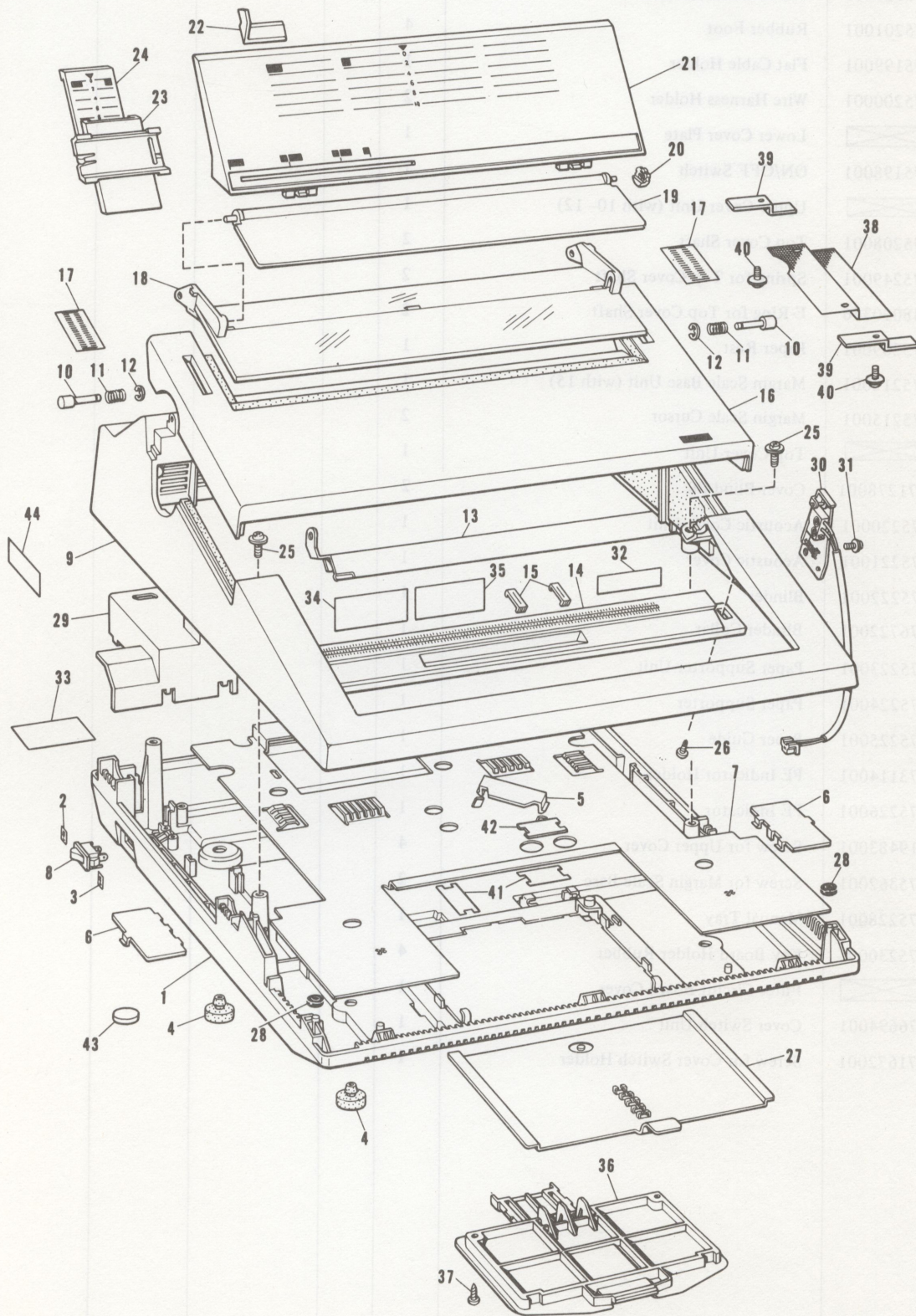
535-531-061



COVER

MAIN-  
REF. NO.

TF-061





## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-061                                                                            | Functional group name                    | COVER |     |          |            |       |        |
|---------------|-----------------------------------------------------------------------------------|------------------------------------------|-------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                                     | Q'TY  | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                   |                                          |       |     |          | FROM       | UP TO |        |
| 32            | 572037001                                                                         | Lable for UL Fuse (U.S.A. only)          | 1     |     |          |            |       |        |
| 33            | 575361001                                                                         | Fuse Indicator (1A) (England only)       | 1     |     |          |            |       |        |
| 34            | U01810001                                                                         | Lable for F.C.C. (U.S.A. only)           | 1     |     |          |            |       |        |
| 35            |  | Rating Plate                             | 1     |     |          |            |       |        |
| 36            | 576061001                                                                         | Keyboard Lower Cover (C.S.A. only)       | 1     |     |          |            |       |        |
| 37            | 576161001                                                                         | Screw for K.B. Lower Cover (C.S.A. only) | 2     |     |          |            |       |        |
| 38            | 576610001                                                                         | Wire Net Lid (C.S.A. only)               | 1     |     |          |            |       |        |
| 39            | 576611001                                                                         | Wire Net Lid Holder (C.S.A. only)        | 2     |     |          |            |       |        |
| 40            | 533332001                                                                         | Screw for Wire Net Lid                   | 2     |     |          |            |       |        |
| 41            | 576612000                                                                         | Cable Protecting Plate A (C.S.A. only)   | 2     |     |          |            |       |        |
| 42            | 576626000                                                                         | Cable Protecting Film B (C.S.A. only)    | 1     |     |          |            |       |        |
| 43            | 576629000                                                                         | Fuse Holder Cover (FEMKO only)           | 1     |     |          |            |       |        |
| 44            | 130520001                                                                         | Lable for EEC                            | 1     |     |          |            |       |        |

## SPECIAL PARTS

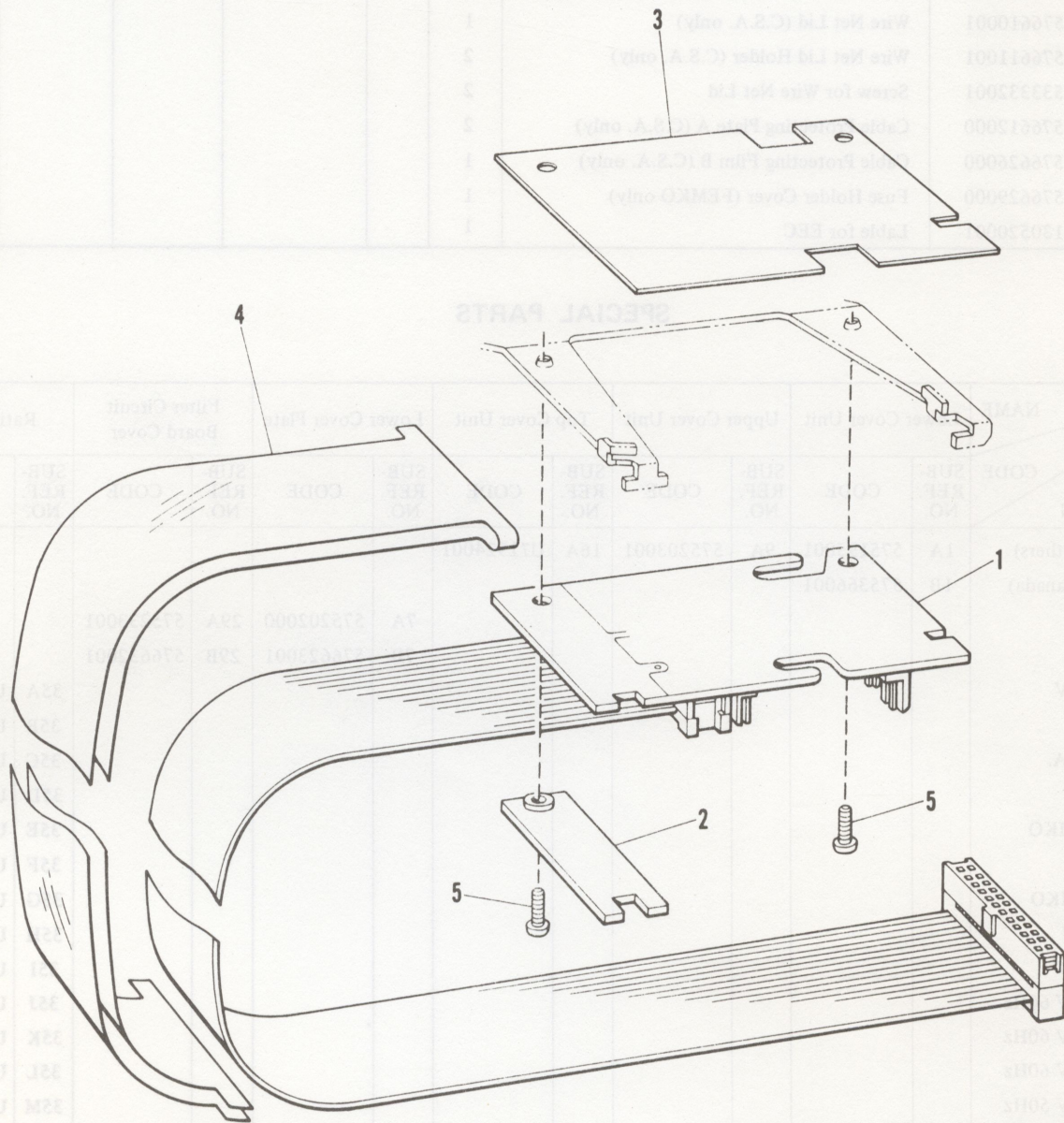
| NAME<br>COLOR & DESCRIPTION | Lower Cover Unit |           | Upper Cover Unit |           | Top Cover Unit |           | Lower Cover Plate |           | Filter Circuit Board Cover |           | Rating Plate |           |
|-----------------------------|------------------|-----------|------------------|-----------|----------------|-----------|-------------------|-----------|----------------------------|-----------|--------------|-----------|
|                             | SUB-REF. NO.     | CODE      | SUB-REF. NO.     | CODE      | SUB-REF. NO.   | CODE      | SUB-REF. NO.      | CODE      | SUB-REF. NO.               | CODE      | SUB-REF. NO. | CODE      |
| Cream-364 (Others)          | 1A               | 575195001 | 9A               | 575203001 | 16A            | U71924001 |                   |           |                            |           |              |           |
| Cream-364 (Canada)          | 1B               | 575366001 |                  |           |                |           |                   |           |                            |           |              |           |
| Others                      |                  |           |                  |           |                |           | 7A                | 575202000 | 29A                        | 575233001 |              |           |
| C.S.A. only                 |                  |           |                  |           |                |           | 7B                | 576623001 | 29B                        | 576632001 |              |           |
| B EM-250 115V               |                  |           |                  |           |                |           |                   |           |                            |           | 35A          | U71925001 |
| B EM-250 UL                 |                  |           |                  |           |                |           |                   |           |                            |           | 35B          | U71926001 |
| B EM-250 C.S.A.             |                  |           |                  |           |                |           |                   |           |                            |           | 35C          | U71927001 |
| B EM-250 SEV                |                  |           |                  |           |                |           |                   |           |                            |           | 35D          | U71928001 |
| B EM-250 NEMKO              |                  |           |                  |           |                |           |                   |           |                            |           | 35E          | U71929001 |
| B EM-250 BS                 |                  |           |                  |           |                |           |                   |           |                            |           | 35F          | U71930001 |
| B EM-250 FEMKO              |                  |           |                  |           |                |           |                   |           |                            |           | 35G          | U71931001 |
| B EM-250 TUV                |                  |           |                  |           |                |           |                   |           |                            |           | 35H          | U71932001 |
| B EM-250 100V               |                  |           |                  |           |                |           |                   |           |                            |           | 35I          | U71934001 |
| B EM-250 110V 60Hz          |                  |           |                  |           |                |           |                   |           |                            |           | 35J          | U71935001 |
| B EM-250 115V 60Hz          |                  |           |                  |           |                |           |                   |           |                            |           | 35K          | U71936001 |
| B EM-250 120V 60Hz          |                  |           |                  |           |                |           |                   |           |                            |           | 35L          | U71937001 |
| B EM-250 200V 50Hz          |                  |           |                  |           |                |           |                   |           |                            |           | 35M          | U71938001 |
| b EM-250 f (VDE)            |                  |           |                  |           |                |           |                   |           |                            |           | 35N          | U71939001 |
| B EM-250 220V(French)       |                  |           |                  |           |                |           |                   |           |                            |           | 35P          | U71940001 |
| B EM-250 220V               |                  |           |                  |           |                |           |                   |           |                            |           | 35Q          | U71941001 |
| B EM-250 230V               |                  |           |                  |           |                |           |                   |           |                            |           | 35R          | U71942001 |
| B EM-250 240V 50Hz          |                  |           |                  |           |                |           |                   |           |                            |           | 35S          | U71957001 |

535-531-061



RELAY CIRCUIT BOARD

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-101 |
|-------------------|--------|



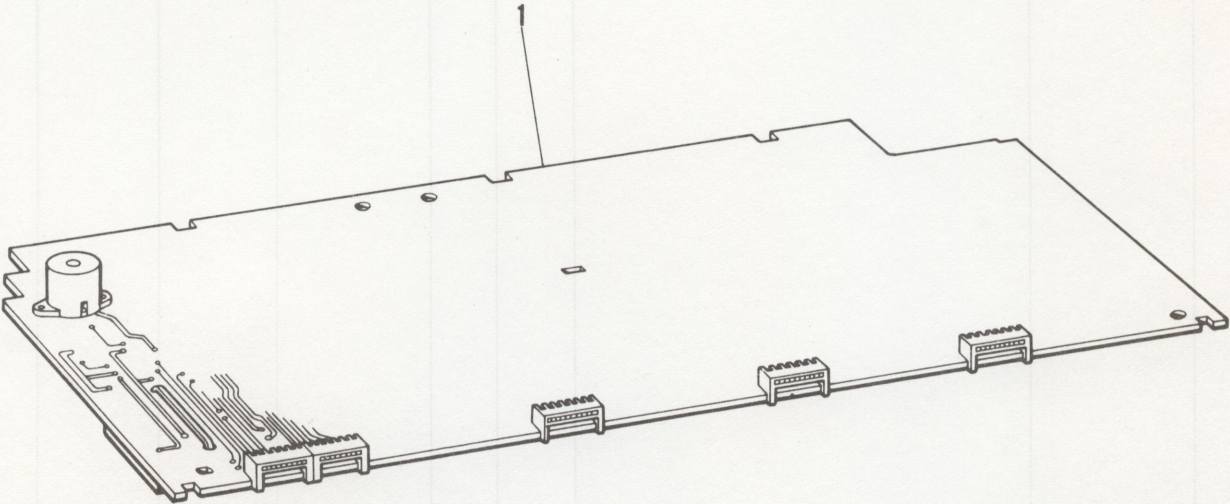






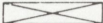
DRIVER CIRCUIT BOARD

|               |        |
|---------------|--------|
| MAIN-REF. NO. | TF-102 |
|---------------|--------|



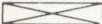


## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-102                                                                            | Functional group name         | DRIVER CIRCUIT BOARD |     |          |            |       |        |
|---------------|-----------------------------------------------------------------------------------|-------------------------------|----------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                          | Q'TY                 | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                   |                               |                      |     |          | FROM       | UP TO |        |
| 1             |  | Driver Circuit Board Assembly | 1                    |     |          |            |       |        |

## SPECIAL PARTS

| NAME<br>COLOR & DESCRIPTION             | Driver Circuit Board Assembly |              |      |  |  |  |  |  |  |  |  |  |
|-----------------------------------------|-------------------------------|--------------|------|--|--|--|--|--|--|--|--|--|
|                                         | CODE                          | SUB-REF. NO. | CODE |  |  |  |  |  |  |  |  |  |
| American English                        | 1A                            | U71943000    |      |  |  |  |  |  |  |  |  |  |
| German                                  | 1B                            | U71943004    |      |  |  |  |  |  |  |  |  |  |
| King's English                          | 1C                            | U71943003    |      |  |  |  |  |  |  |  |  |  |
| French                                  | 1D                            | U71943012    |      |  |  |  |  |  |  |  |  |  |
| Dutch                                   | 1E                            | U71943013    |      |  |  |  |  |  |  |  |  |  |
| Swiss (German French)                   | 1F                            | U71943016    |      |  |  |  |  |  |  |  |  |  |
| Bilingual                               | 1G                            | U71943002    |      |  |  |  |  |  |  |  |  |  |
| Spanish (South America Central America) | 1H                            | U71943008    |      |  |  |  |  |  |  |  |  |  |
| Norwegian                               | 1I                            | U71943010    |      |  |  |  |  |  |  |  |  |  |
| Spanish for Spain                       | 1J                            | U71943014    |      |  |  |  |  |  |  |  |  |  |
| Italian                                 | 1K                            | U71943005    |      |  |  |  |  |  |  |  |  |  |
| Danish                                  | 1L                            | U71943011    |      |  |  |  |  |  |  |  |  |  |
| South Africa                            | 1M                            | U71943015    |      |  |  |  |  |  |  |  |  |  |
| Swedish                                 | 1N                            | U71943018    |      |  |  |  |  |  |  |  |  |  |
| Finnish                                 | 1P                            | U71943019    |      |  |  |  |  |  |  |  |  |  |
| Portuguese                              | 1Q                            | U71943020    |      |  |  |  |  |  |  |  |  |  |
| Latin & Greek                           | 1R                            | U71943022    |      |  |  |  |  |  |  |  |  |  |
| Chili                                   | 1S                            | U71943009    |      |  |  |  |  |  |  |  |  |  |
| Turkish                                 | 1T                            | U71943025    |      |  |  |  |  |  |  |  |  |  |

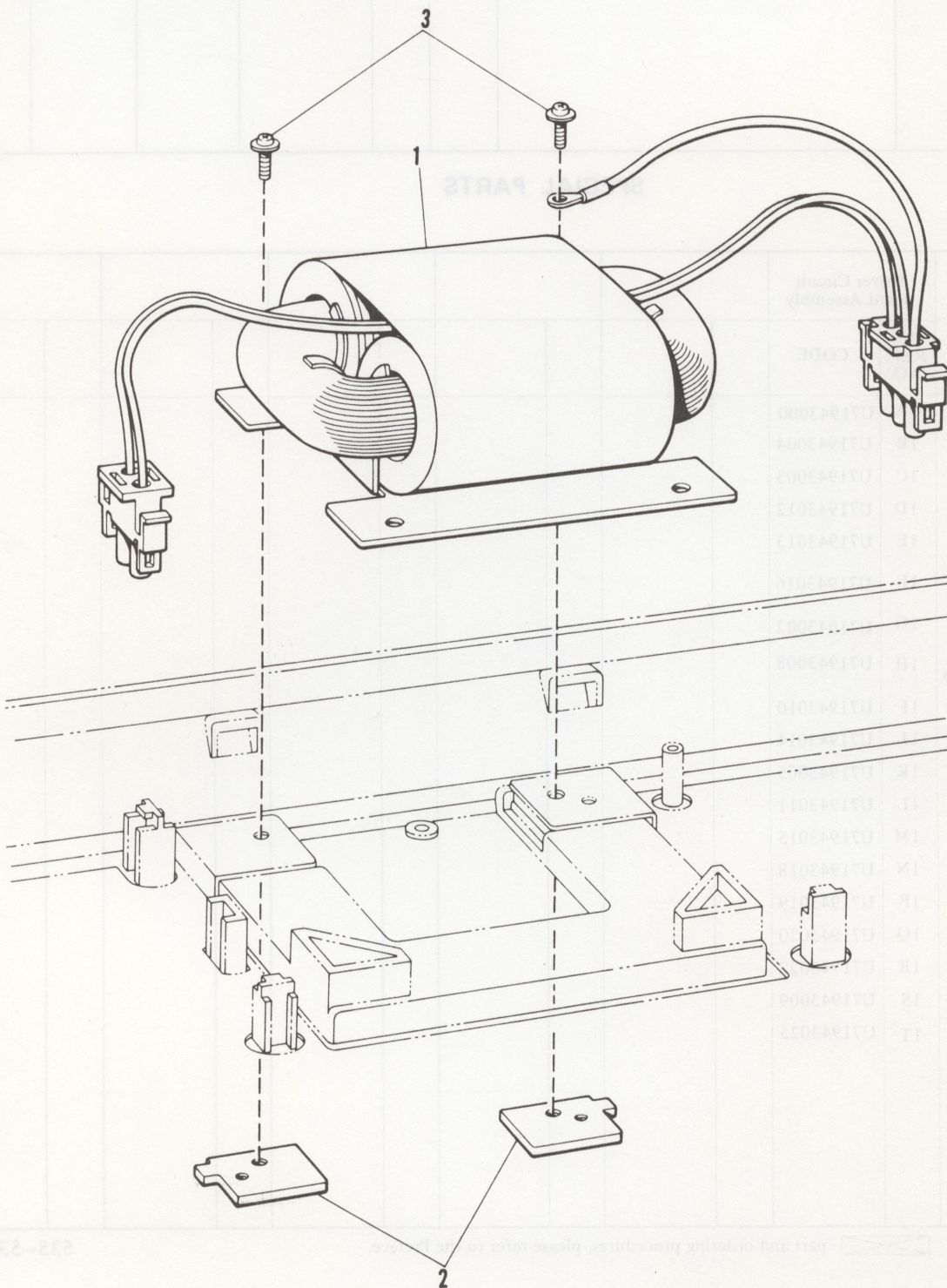
Caution : To visualize the  part and ordering procedures, please refer to the Preface.

535-531-102



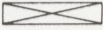
POWER SUPPLY TRANSFORMER

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-105 |
|-------------------|--------|



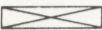


## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-105                                                                            | Functional group name      | POWER SUPPLY TRANSFORMER |     |          |            |       |        |
|---------------|-----------------------------------------------------------------------------------|----------------------------|--------------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                       | Q'TY                     | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                   |                            |                          |     |          | FROM       | UP TO |        |
| 1             |  | Power Supply Transformer   | 1                        |     |          |            |       |        |
| 2             | 575640000                                                                         | Transformer Holder Plate   | 2                        |     |          |            |       |        |
| 3             | 215080001                                                                         | Screw for P.S. Transformer | 2                        |     |          |            |       |        |

## SPECIAL PARTS

| NAME<br>CODE<br>COLOR & DESCRIPTION | Power Supply Transformer |           |              |      |              |      |              |      |              |      |              |  |
|-------------------------------------|--------------------------|-----------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|--|
|                                     | SUB-REF. NO.             | CODE      | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. |  |
| 100V (Japan, etc.)                  | 1A                       | 576578001 |              |      |              |      |              |      |              |      |              |  |
| 115V (U.S.A., etc)                  | 1B                       | 576579001 |              |      |              |      |              |      |              |      |              |  |
| 220V (German, etc.)                 | 1C                       | 576580001 |              |      |              |      |              |      |              |      |              |  |
| 230V (Norway, etc.)                 | 1D                       | 576581001 |              |      |              |      |              |      |              |      |              |  |
| 240V (U.K., etc.)                   | 1E                       | 576582001 |              |      |              |      |              |      |              |      |              |  |
| 200V                                | 1F                       | 576658001 |              |      |              |      |              |      |              |      |              |  |
| 110V                                | 1G                       | 576656001 |              |      |              |      |              |      |              |      |              |  |
| 120V (C.S.A.)                       | 1H                       | 576657001 |              |      |              |      |              |      |              |      |              |  |
| 220V (FEMKO)                        | 1I                       | 576590001 |              |      |              |      |              |      |              |      |              |  |

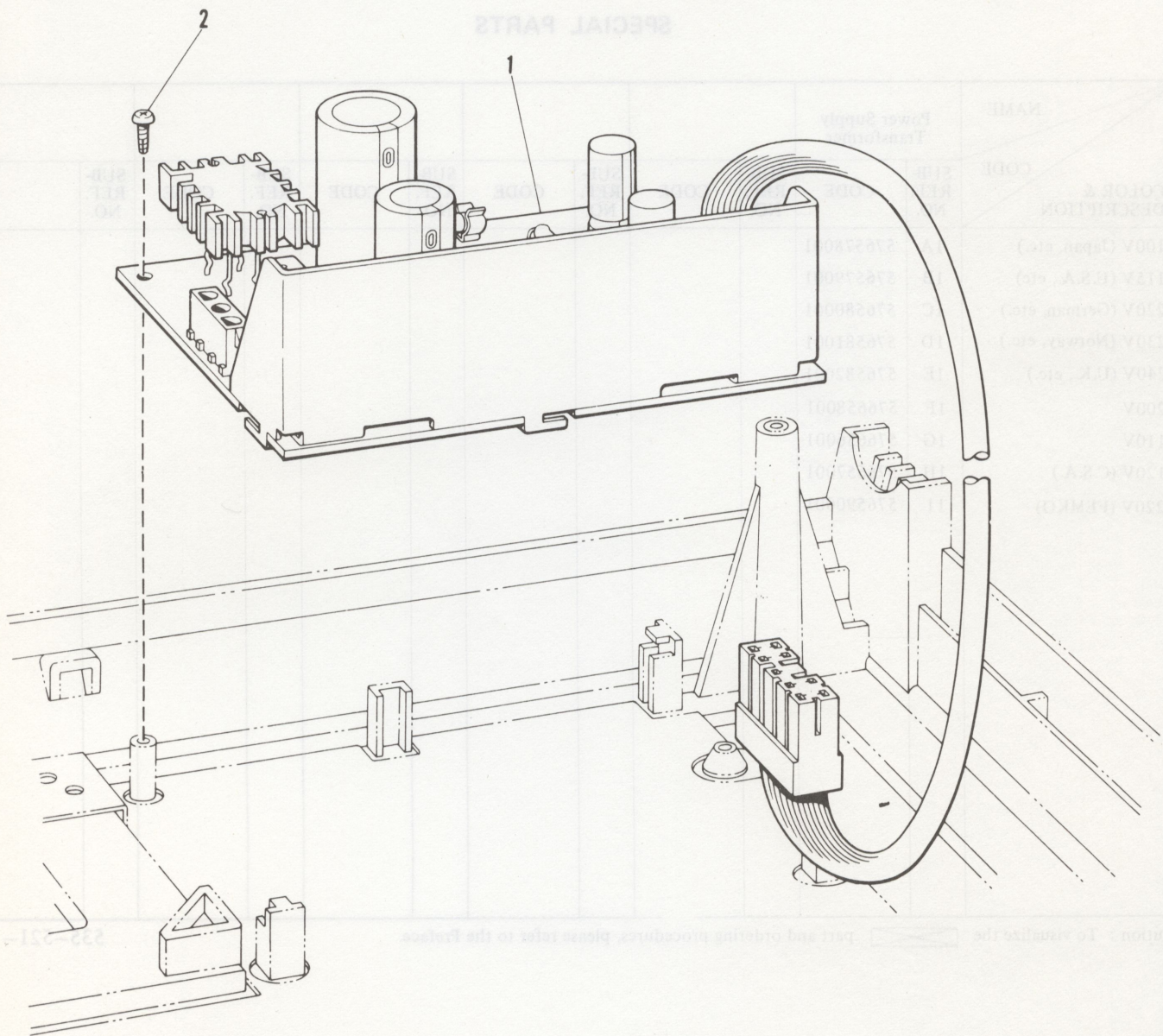
Caution : To visualize the  part and ordering procedures, please refer to the Preface.

535-521-105



POWER SUPPLY CIRCUIT BOARD

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-106 |
|-------------------|--------|



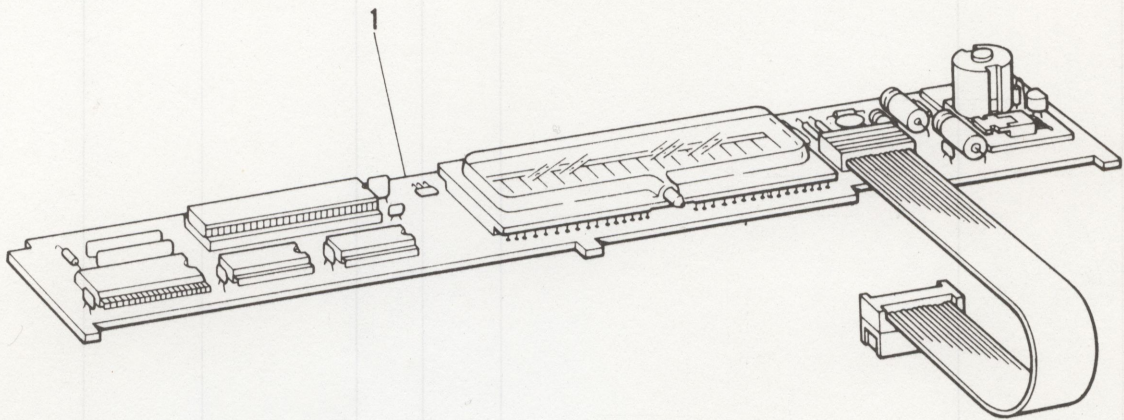






ME DISPLAY CIRCUIT BOARD

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-108 |
|-------------------|--------|





## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-108    | Functional group name          | DISPLAY CIRCUIT BOARD |     |          |            |       |        |
|---------------|-----------|--------------------------------|-----------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE      | NAME                           | Q'TY                  | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |           |                                |                       |     |          | FROM       | UP TO |        |
| 1             | 576585001 | Display Circuit Board Assembly |                       |     |          |            |       |        |



ACCESSORY

|               |        |
|---------------|--------|
| MAIN-REF. NO. | TF-910 |
|---------------|--------|

MAIN-REF. NO. TF-108

FUNCTIONAL GROUP NAME CODE

DISPLAY CIRCUIT BOARD

276782001

1

Display Circuit Board Assembly

NAME

QTY

NEW CODE

FROM

TO

DATE

BY

REMARKS

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REVISION

REVISION

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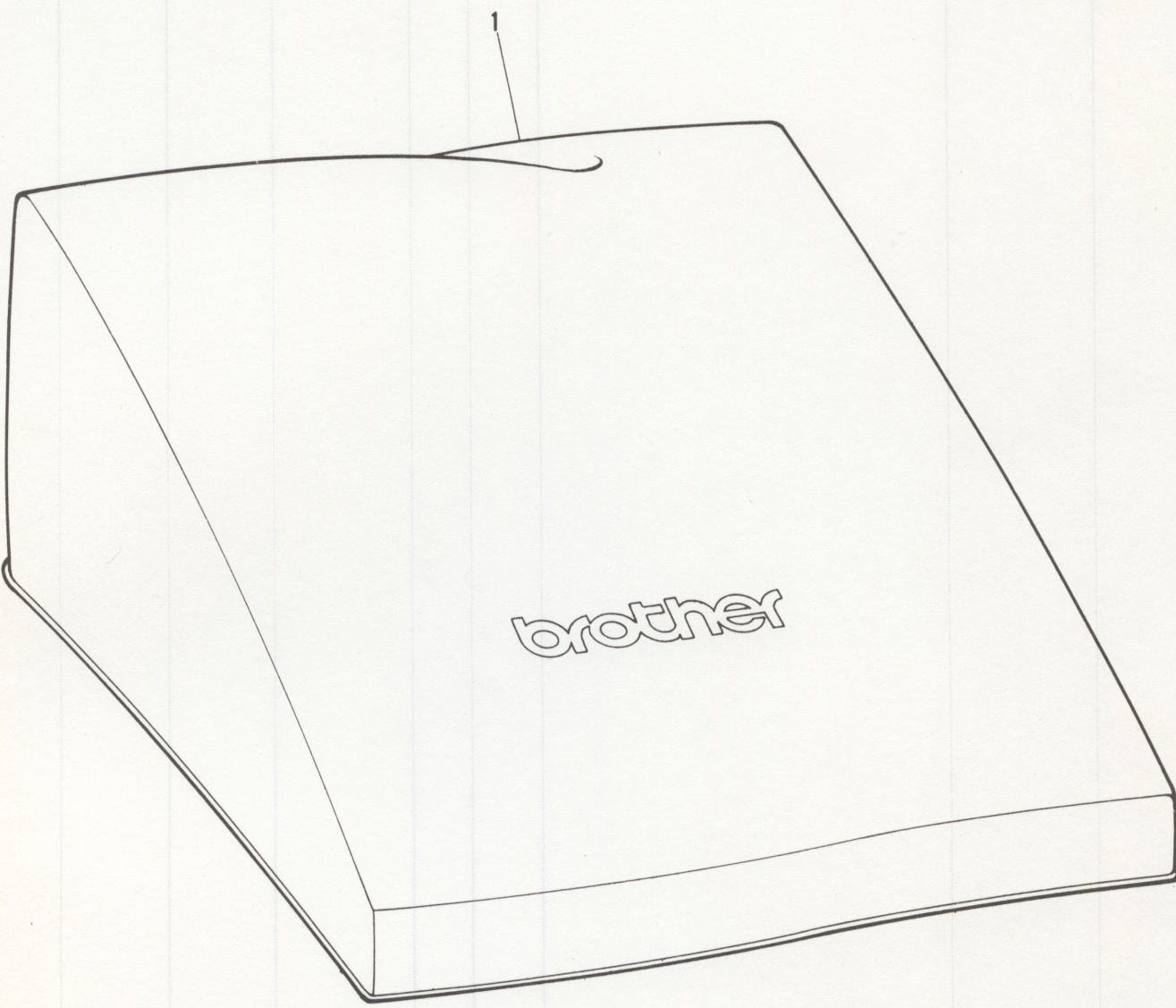
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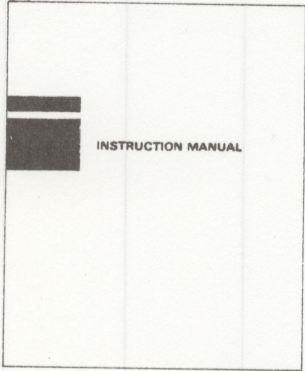




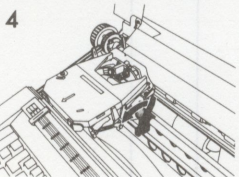
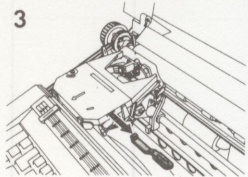
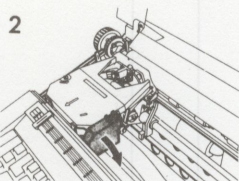
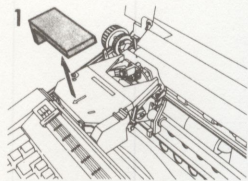


|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-920 |
|-------------------|--------|

1



2



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Invented in Japan  
Printed in Japan

3

**OPERATION GUIDE**

This operation guide is the summary of the basic operating features and operations. Please install the guide sheets to the guide tray, which is located underneath the front portion of the typewriter as follows;

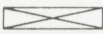
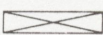
(1) Pull out the guide tray.

(2) Slide the guide sheets into the tray as shown.

(3) You can use this operation guide as a quick reference guide.



## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-920                                                                            | Functional group name       | PRINTED MATTER |     |          |            |       |        |
|---------------|-----------------------------------------------------------------------------------|-----------------------------|----------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                        | Q'TY           | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                   |                             |                |     |          | FROM       | UP TO |        |
| 1             |  | Instruction Book            | 1              |     |          |            |       |        |
| 2             | U71359001                                                                         | Unpacking Instruction Sheet | 1              |     |          |            |       |        |
| 3             |  | Manual Tray Book            | 1              |     |          |            |       |        |

## SPECIAL PARTS

| NAME<br>COLOR & DESCRIPTION    | Instruction Book |           | Manual Tray Book |           |              |      |              |      |              |      |              |      |
|--------------------------------|------------------|-----------|------------------|-----------|--------------|------|--------------|------|--------------|------|--------------|------|
|                                | SUB-REF. NO.     | CODE      | SUB-REF. NO.     | CODE      | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE |
| ENGLISH (U.S.A. & CANADA only) | 1A               | 593553011 | 3A               | 593552031 |              |      |              |      |              |      |              |      |
| GERMAN                         | 1B               | 593553012 | 3B               | 593552032 |              |      |              |      |              |      |              |      |
| ENGLISH (Others)               | 1C               | 593553013 | 3C               | 593552031 |              |      |              |      |              |      |              |      |
| FRENCH                         | 1D               | 593553014 | 3D               | 593552034 |              |      |              |      |              |      |              |      |
| DUTCH                          | 1E               | 593553015 | 3E               | 593552035 |              |      |              |      |              |      |              |      |
| NORWEGIAN                      | 1F               | 593553016 | 3F               | 593552036 |              |      |              |      |              |      |              |      |
| SPANISH                        | 1G               | 593553017 | 3G               | 593552037 |              |      |              |      |              |      |              |      |
| FINNISH                        | 1H               | 593553018 | 3H               | 593552038 |              |      |              |      |              |      |              |      |
| ITALIAN                        | 1I               | 593553019 | 3I               | 593552039 |              |      |              |      |              |      |              |      |
| SWEDISH                        | 1J               | 593553020 | 3J               | 593552040 |              |      |              |      |              |      |              |      |
| DANISH                         | 1K               | 593553021 | 3K               | 593552041 |              |      |              |      |              |      |              |      |
| SWISS GERMAN                   | 1L               | 593553022 | 3L               | 593553032 |              |      |              |      |              |      |              |      |
| SWISS FRENCH                   | 1M               | 593553023 | 3M               | 593552034 |              |      |              |      |              |      |              |      |
| ENGLISH (Australia only)       | 1N               | 593553024 | 3N               | 593552031 |              |      |              |      |              |      |              |      |

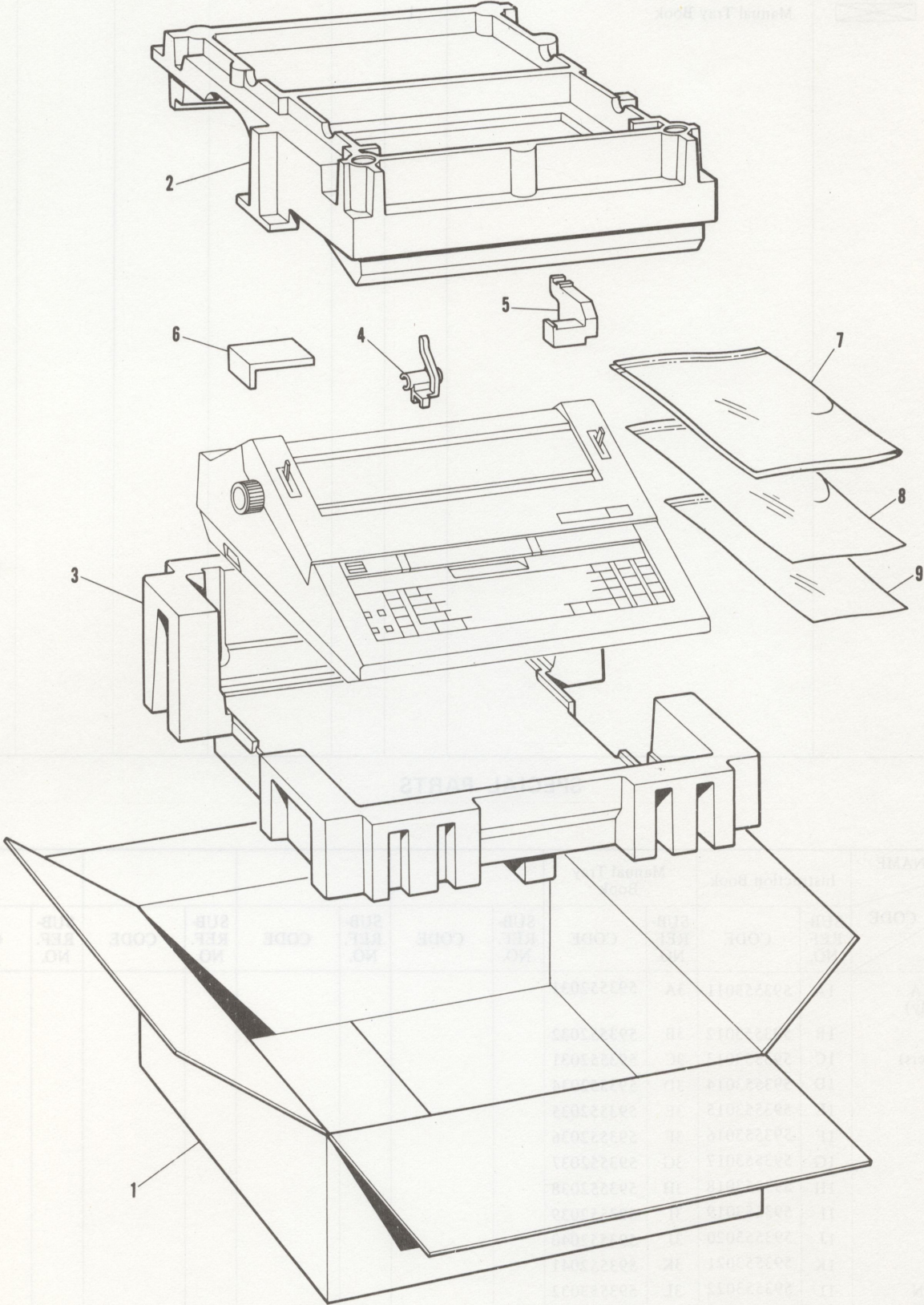
Caution : To visualize the  part and ordering procedures, please refer to the Preface.

535-531-920



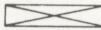
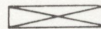
PARTS CODE & PARTS NAME

|                   |        |
|-------------------|--------|
| MAIN-<br>REF. NO. | TF-930 |
|-------------------|--------|



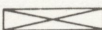


## PARTS CODE &amp; PARTS NAME

| MAIN-REF. NO. | TF-930                                                                            | Functional group name           | PACKING MATERIAL |     |          |            |       |        |
|---------------|-----------------------------------------------------------------------------------|---------------------------------|------------------|-----|----------|------------|-------|--------|
| SUB-REF. NO.  | CODE                                                                              | NAME                            | Q'TY             | C/P | NEW CODE | PRODUCTION |       | REMARK |
|               |                                                                                   |                                 |                  |     |          | FROM       | UP TO |        |
| 1             |  | Carton                          | 1                |     |          |            |       |        |
| 2-3           | U60100001                                                                         | Styrofoam for Body Unit         | 1                |     |          |            |       |        |
| 2             | 562312001                                                                         | Styrofoam for Upper Cover       | 1                |     |          |            |       |        |
| 3             | U60099001                                                                         | Styrofoam for Lower Cover       | 1                |     |          |            |       |        |
| 4             | 562930000                                                                         | Stopper for Carrier Unit        | 1                |     |          |            |       |        |
| 5             | 562286001                                                                         | Pad for Carrier Unit            | 1                |     |          |            |       |        |
| 6             | 562285001                                                                         | Pad for Cassette Ribbon         | 1                |     |          |            |       |        |
| 7             |  | Plastic Bag for Body            | 1                |     |          |            |       |        |
| 8             | 562077000                                                                         | Plastic Bag for Acoustic Cover  | 1                |     |          |            |       |        |
| 9             | 562077000                                                                         | Plastic Bag for Paper Supporter | 1                |     |          |            |       |        |

## SPECIAL PARTS

| NAME<br>COLOR & DESCRIPTION          | Carton       |           | Plastic Bag for Body |           |              |      |              |      |  |  |  |  |
|--------------------------------------|--------------|-----------|----------------------|-----------|--------------|------|--------------|------|--|--|--|--|
|                                      | SUB-REF. NO. | CODE      | SUB-REF. NO.         | CODE      | SUB-REF. NO. | CODE | SUB-REF. NO. | CODE |  |  |  |  |
| Non Brand                            | 1A           | U60088021 |                      |           |              |      |              |      |  |  |  |  |
| Brother (Europe)(U.S.A.)<br>(Others) | 1B           | U60088054 |                      |           |              |      |              |      |  |  |  |  |
| Brother (CANADA)                     | 1C           | U60088041 |                      |           |              |      |              |      |  |  |  |  |
| Brother (FRENCH).                    | 1E           | U60088055 |                      |           |              |      |              |      |  |  |  |  |
| Others                               |              |           | 7A                   | 561752000 |              |      |              |      |  |  |  |  |
| ENGLAND only                         |              |           | 7B                   | 561785000 |              |      |              |      |  |  |  |  |

Caution : To visualize the  part and ordering procedures, please refer to the Preface.

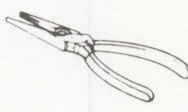
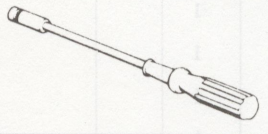
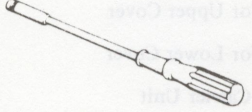
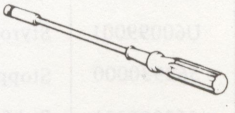
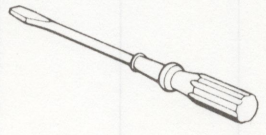
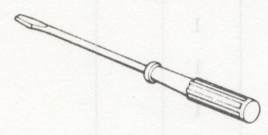
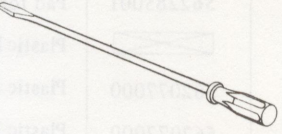
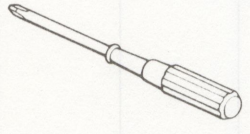
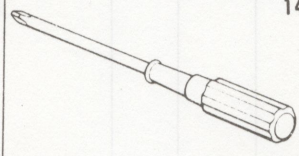
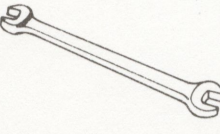
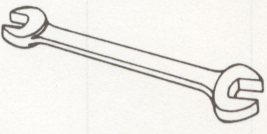
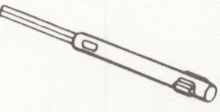
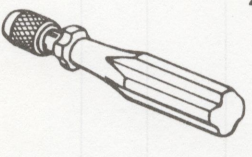
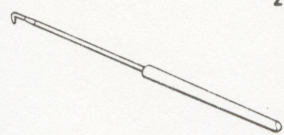
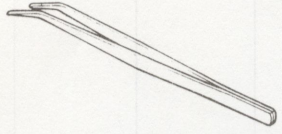
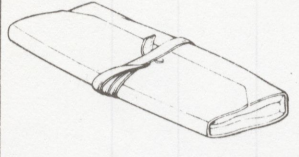
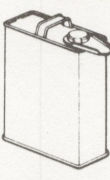
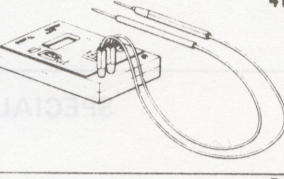
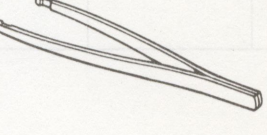
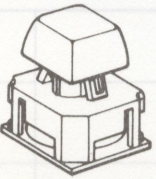
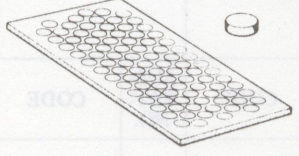
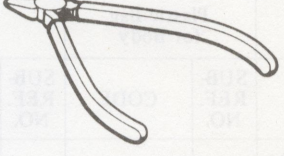
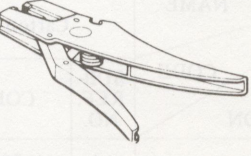
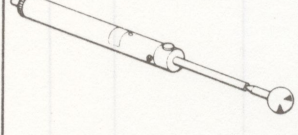
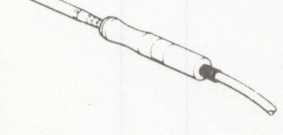
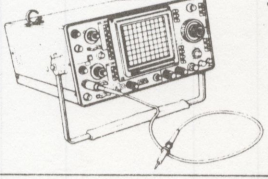
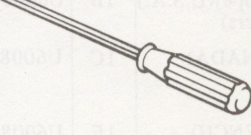
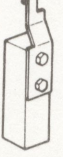
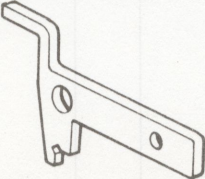
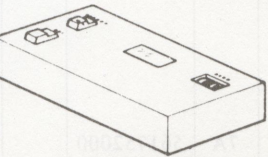
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## ADJUSTING TOOL KIT

MAIN-  
REF. NO.

ZX-15X

|                                                                                     |            |                                                                                     |    |                                                                                      |            |                                                                                       |      |
|-------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------|------|
|    | 1          |    | 4  |    | 5          |    | 6    |
|    | 9          |    | 10 |    | 11         |    | 12   |
|    | 13         |    | 14 |    | 18         |    | 19-1 |
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# **SERVICE MANUAL**

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## SERVICE MANUAL

## [MECHANICAL PORTION]

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## 1 GENERAL DESCRIPTION

### GENERAL COMPOSITION

Electronic office typewriter EM-250 can be sub-divided into the following five blocks.

1. Carrier head unit

The carrier head is composed of print, ribbon feed, ribbon lift and correction mechanism, and the carrier body mounts wheel motor, hammer solenoid, ribbon feed motor, ribbon lift solenoid, correction solenoid, ribbon end sensor and head indicator.

2. Chassis and platen unit

The chassis unit mounts the carrier motor and drive wire for moving the carrier. In addition, platen unit, line feed motor for driving the platen, mechanisms related to paper feed and paper bail solenoid are also mounted to the chassis unit.

3. Keyboard unit

The keyboard unit is composed of keyboard, keyboard circuit board, driver circuit board and display circuit board.

4. Power-supply unit

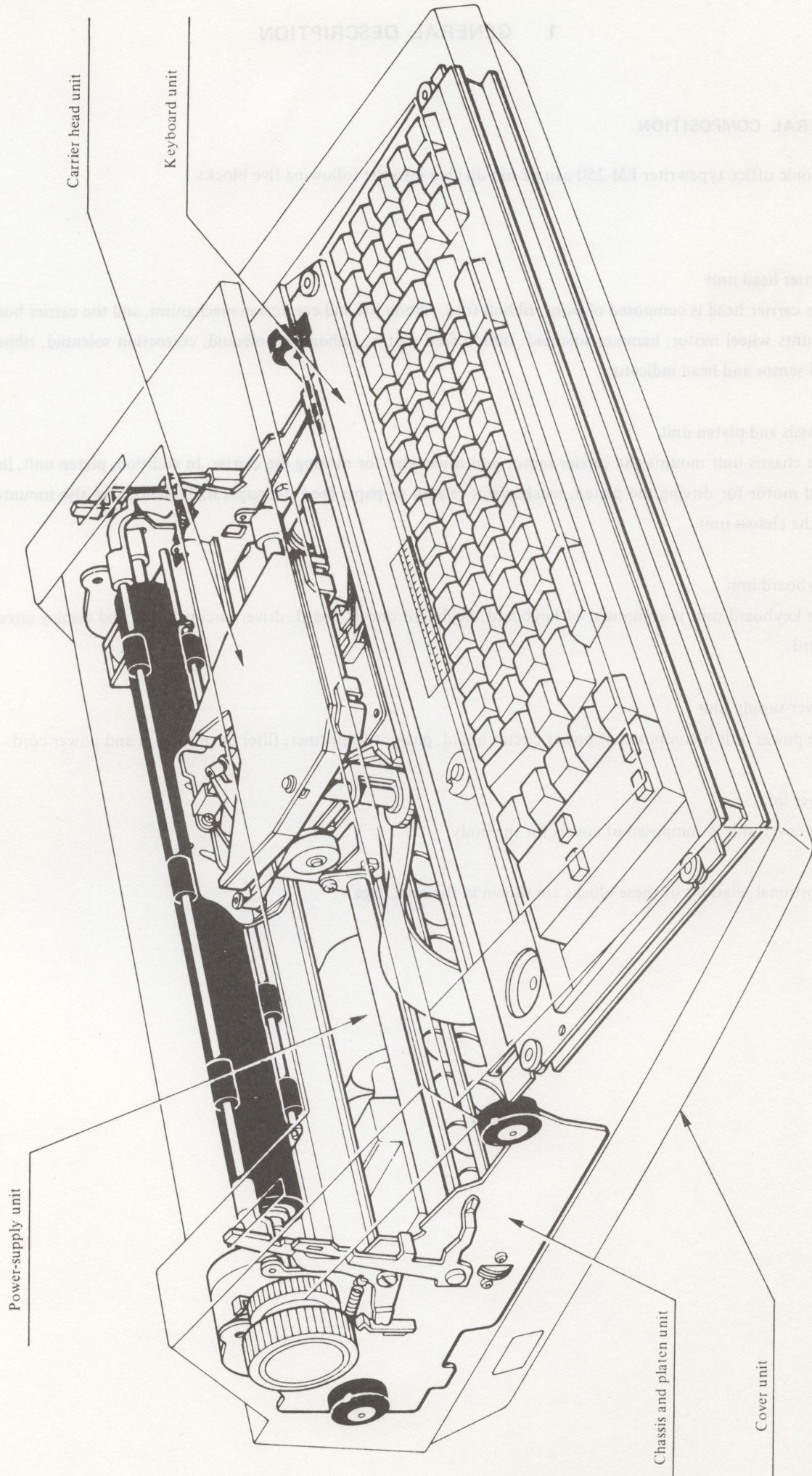
The power unit is composed of power circuit board, power transformer, filter circuit board and power cord.

5. Cover unit

The cover unit is composed of covers for the body.

The postional relations of these blocks are shown in the next page.



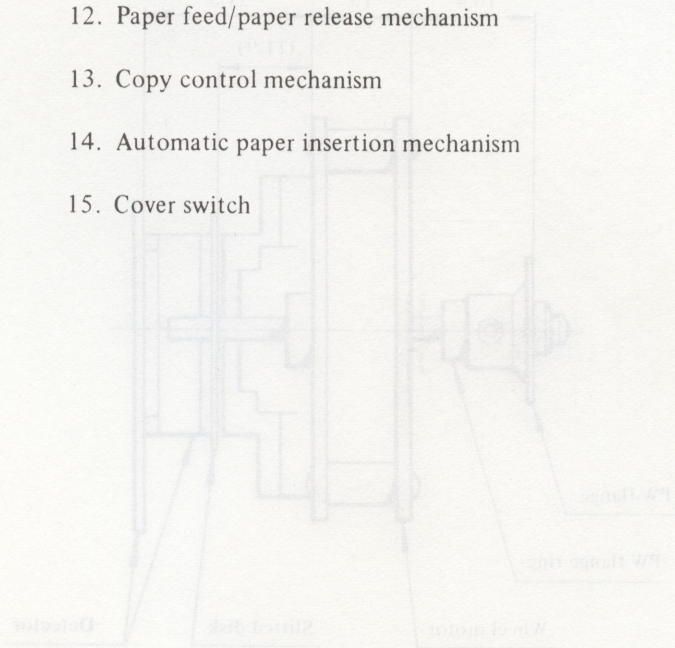




## 2 OPERATION OF MECHANICAL SYSTEM

The mechanical system is configured of the following components.

1. Print mechanism
2. Carrier movement mechanism
3. Ribbon-feed mechanism
4. Ribbon-lift mechanism
5. Correction mechanism
6. Paper meter
7. Ribbon end sensor
8. Head indicator
9. Relay circuit board
10. Platen
11. Platen drive mechanism
12. Paper feed/paper release mechanism
13. Copy control mechanism
14. Automatic paper insertion mechanism
15. Cover switch





## 1. PRINT MECHANISM

Model EM-250 employs a DC motor to select the correct position of the daisy wheel and then stop, and a print hammer solenoid for printing.

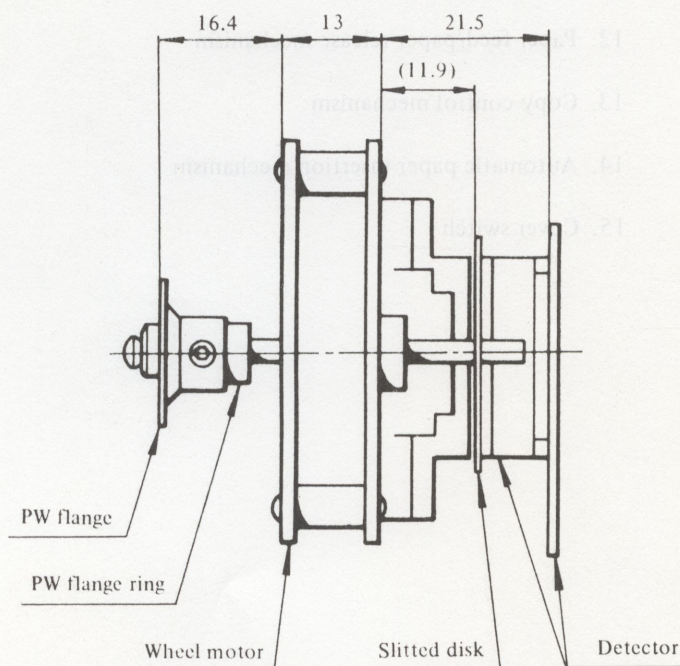
### 1.1 Wheel motor unit

The wheel motor unit is composed of DC motor, a detector, a slitted disk and PW (Print Wheel) flange. The home position of the wheel motor is determined as a slitted disk is fixed to the wheel motor shaft and the slitted disk has indexes, and the wheel motor is capable of turning to the position of the type that is determined for each keyboard signal and of stopping in this position. The detector feeds back positional information on the rotation of the slitted disk.

This slitted disk is split into 192 segments, which is twice as much as the number of printing types, which is 96, for elevating the stopping accuracy.

The PW flange is fixed on the wheel motor shaft on the side opposite to the slitted disk. It is coupled to the daisy wheel and transmits the rotation of the motor to rotation of the daisy wheel. Furthermore, attachment/removal of the print wheel is permitted by the PW flange.

The positional relations of these components are shown below.



As the wheel motor unit requires adjustment using a special checker and gauge, units assembled and adjusted at factory are supplied as spare parts.

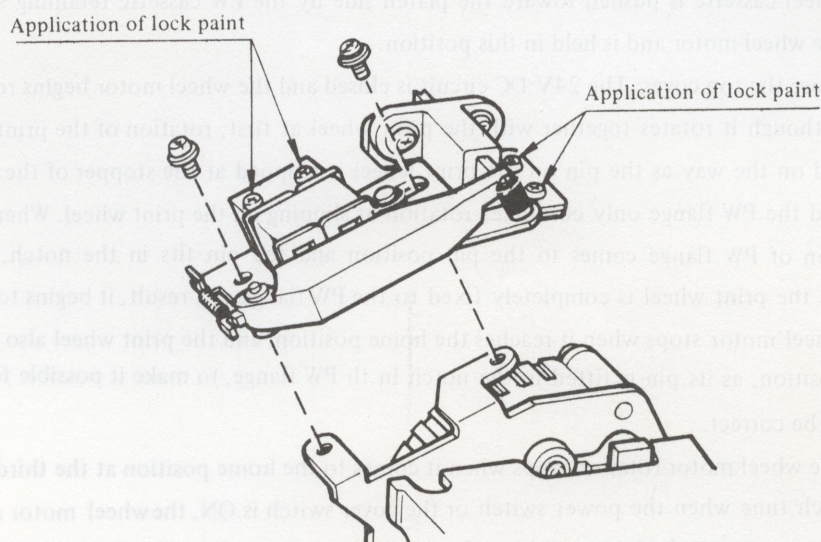
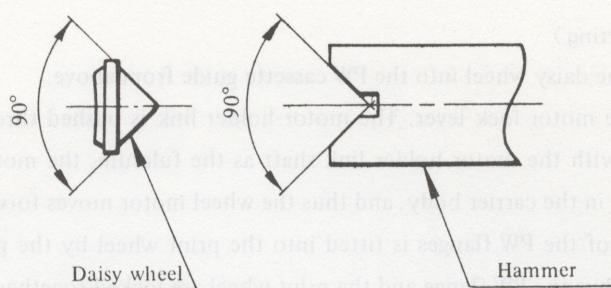


## 1.2 Print hammer solenoid

This is plunge-type hammer solenoid which strikes the printing element selected.

Its impact is controlled to two levels, that is, high, medium high, medium low and low, is automatically made in accordance with the type of letter, and in addition, it is possible to select the print impression out of three levels, that is, high, medium and low, on the keyboard in accordance with the number of copies and paper type. Control of the hammer solenoid is made by the keyboard CPU.

The end of the hammer is cut into vee shape for matching the detent of daisy wheel for elevating the pitch accuracy of printed characters.



The hammer solenoid is illustrated above. It is suitably adjusted using a special gauge at factory so that a suitable impact force is produced. (The screws to which lock paint is applied should never be loosened.)



### 1.3 Print wheel attachment/removal mechanism

This mechanism permits attachment/removal of a daisy wheel in the form of a cassette, and replacement of the print wheel can be made in the steps described below.

#### < Print wheel release >

- (1) Open the top cover. The cover switch is actuated and the 24V DC circuit is opened.
- (2) Pull the motor lock lever. As soon as the motor lock stopper is caused to turn, the wheel motor is unlocked and turns with the motor holder link shaft as the fulcrum, the motor support shaft reverses to this side by sliding in the hole in the carrier body.
- (3) This backward movement of the wheel motor causes the PW flange and the print wheel to become uncoupled, so that the print wheel becomes free.
- (4) Draw the print wheel cassette upward out of the PW cassette guide.

#### < Print wheel setting >

- (1) Insert the daisy wheel into the PW cassette guide from above.
- (2) Push the motor lock lever. The motor holder link is pushed through the motor lock link and is turned with the motor holder link shaft as the fulcrum, the motor support shaft slides through the hole in the carrier body, and thus the wheel motor moves forward.
- (3) The tip of the PW flanges is fitted into the print wheel by the print wheel attachment/removal spring, thus the PW flange and the print wheel are locked together.
- (4) Release the motor lock lever. The wheel motor begins to reverse as it is pulled by a pull spring, and is fixed in the position where it is locked by the motor lock stopper. At this time, the print wheel cassette is pushed toward the platen side by the PW cassette retaining spring attached to the wheel motor and is held in this position.
- (5) Close the top cover. The 24V DC circuit is closed and the wheel motor begins rotating clockwise. Although it rotates together with the print wheel at first, rotation of the print wheel is obstructed on the way as the pin on the print wheel is stopped at the stopper of the PW cassette guide and the PW flange only continues rotation as slipping on the print wheel. When the notched section of PW flange comes to the pin position and the pin fits in the notch, the pin extracts. As the print wheel is completely fixed to the PW flange as a result, it begins to rotate again. The wheel motor stops when it reaches the home position, and the print wheel also stops in the home position, as its pin is fitted in the notch in the PW flange, to make it possible for type selection to be correct.

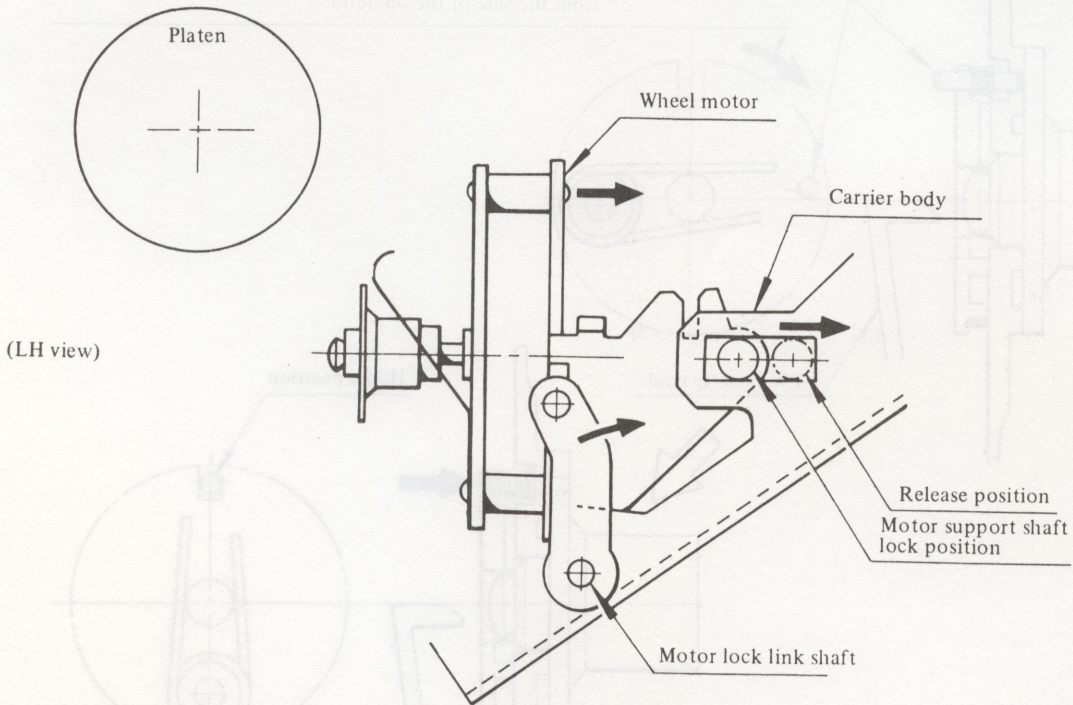
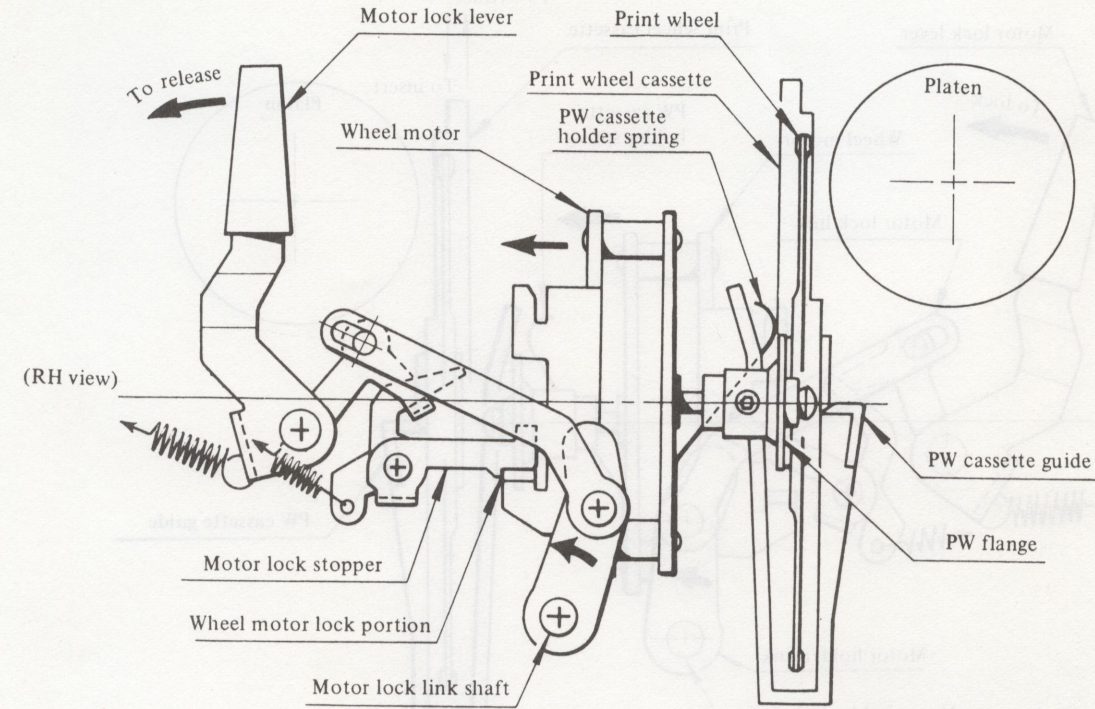
The wheel motor rotation stops when it comes to the home position at the third occasion.

Each time when the power switch or the cover switch is ON, the wheel motor always rotates until it comes to the home position three times in order to permit positive engagement of the print wheel pin with the notch in the PW flange, in order that type selection is correctly made.

In the case where the cover switch connector is disconnected, the operation described above is performed after the ribbon end is sensed.

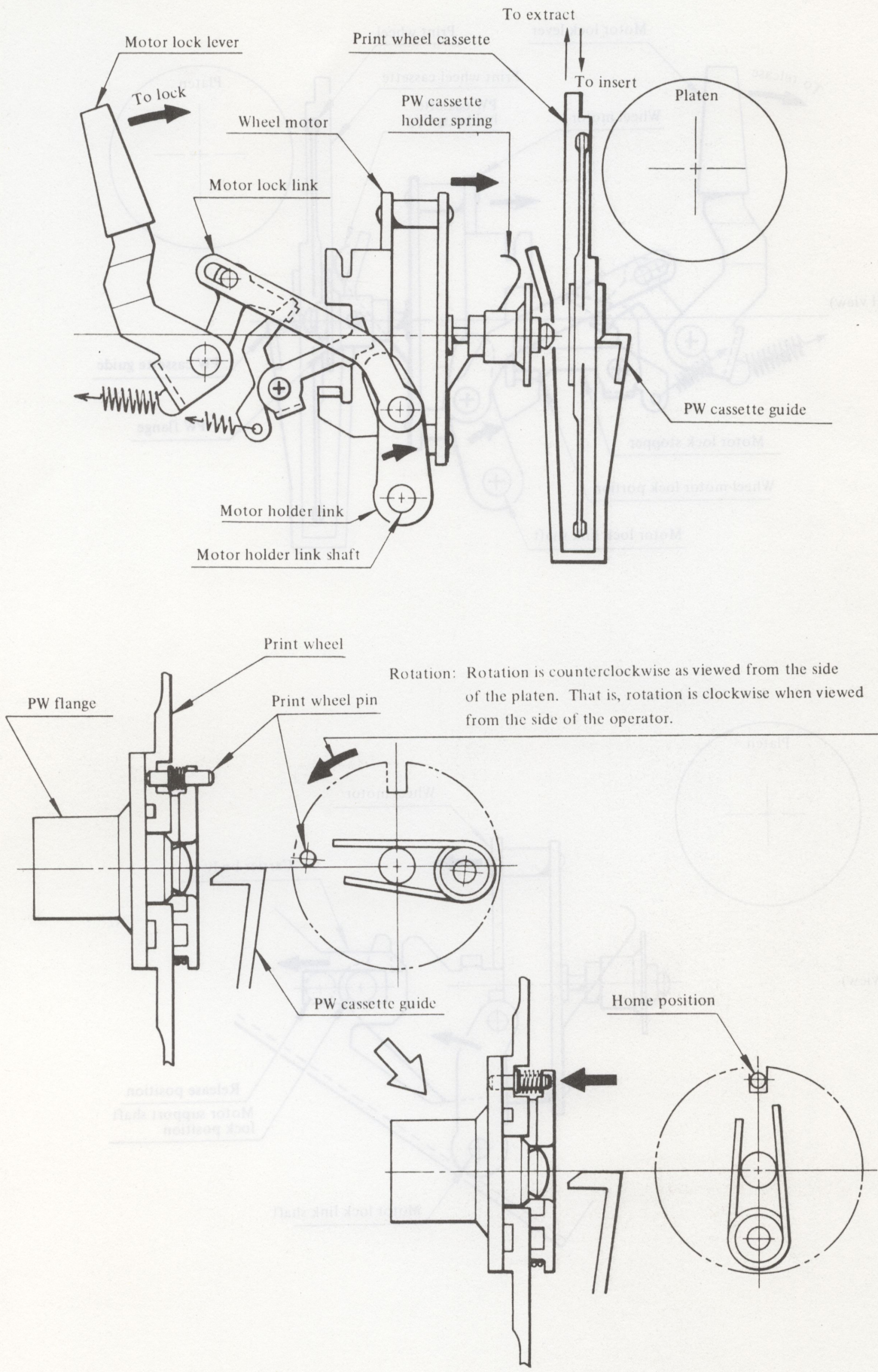


Print wheel release





Print wheel setting

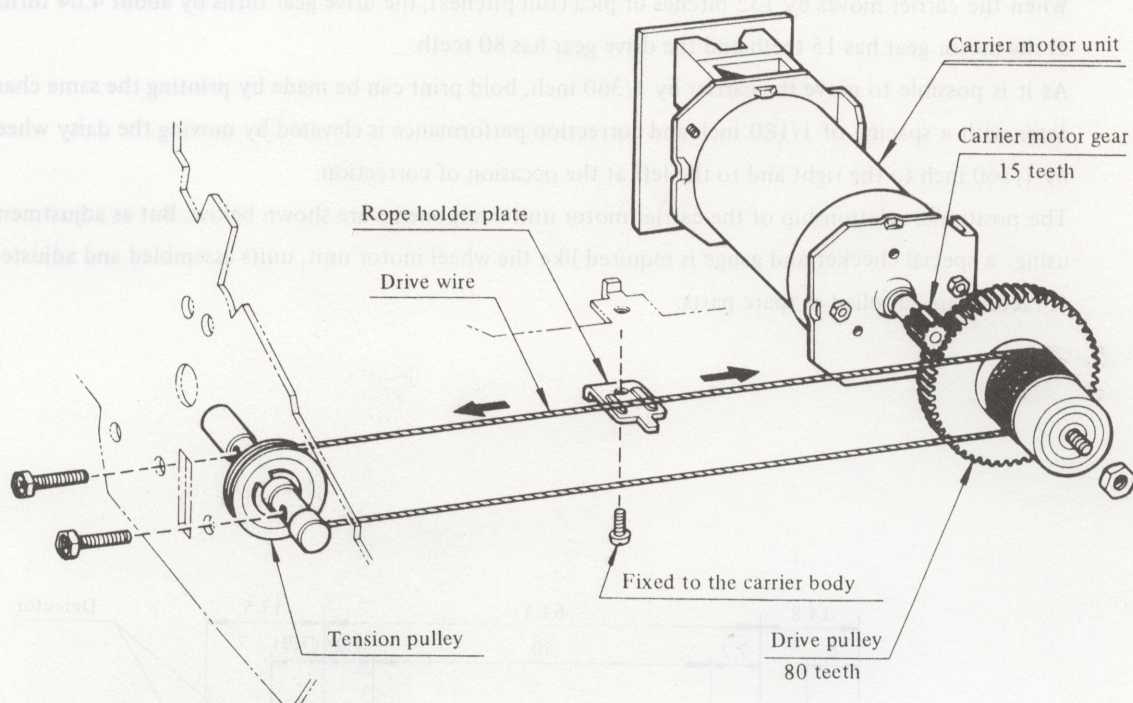




## 2. CARRIER MOVEMENT MECHANISM

All movement related to carrier movement (escapement, spacing, back-spacing, carrier return, tab-setting, etc.) are performed by the carrier motor used as the drive source.

The carrier movement mechanism is composed of carrier motor unit, drive pulley, tension pulley and drive wire.



When the carrier motor rotates, the drive pulley is caused to rotate as the gear of the drive pulley is engaged with the carrier motor gear.

The drive wire is strung on the drive pulley through the tension pulley.

As the carrier body is fixed to the drive wire by means of the rope set plate and fixing screw, the carrier moves rightward and leftward in accordance with rotation of the carrier motor.



## 2.1 Carrier motor unit

The carrier motor unit is composed of DC motor, detector, slitted disk and carrier motor gear.

Detector and slitted disk used in the carrier motor unit are same as those used in the wheel motor unit.

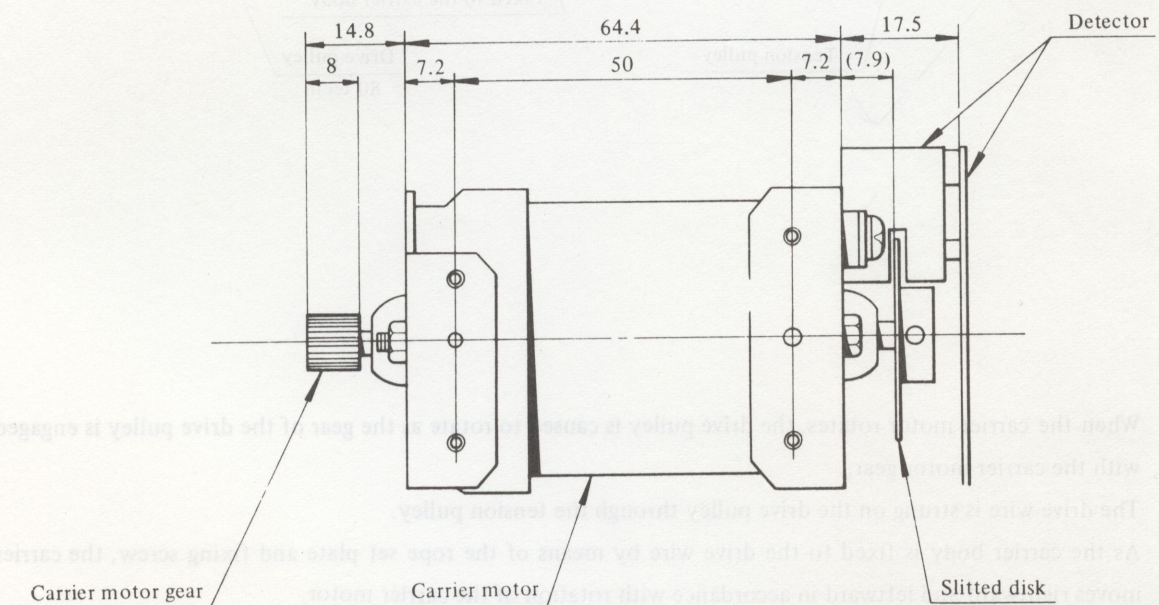
The slitted disk has equally spaced 192 slits, and the gear ratio and drive pulley diameter have been determined so that rotation of the carrier motor by one segment is equivalent to carrier movement of  $1/360$  inch.

For moving the carrier by one pitch of pica, therefore, the disk rotation is 36 segments ( $67.5^\circ$  in motor shaft rotation), and for 132 pitches of pica (full pitches), the disk rotation is 4,752 segments (24 full turns and  $270^\circ$  in motor shaft rotation).

When the carrier moves by 132 pitches of pica (full pitches), the drive gear turns by about 4.64 turns, as the motor gear has 15 teeth and the drive gear has 80 teeth.

As it is possible to move the carrier by  $1/360$  inch, bold print can be made by printing the same character with a spacing of  $1/180$  inch and correction performance is elevated by moving the daisy wheel by  $1/360$  inch to the right and to the left at the occasion of correction.

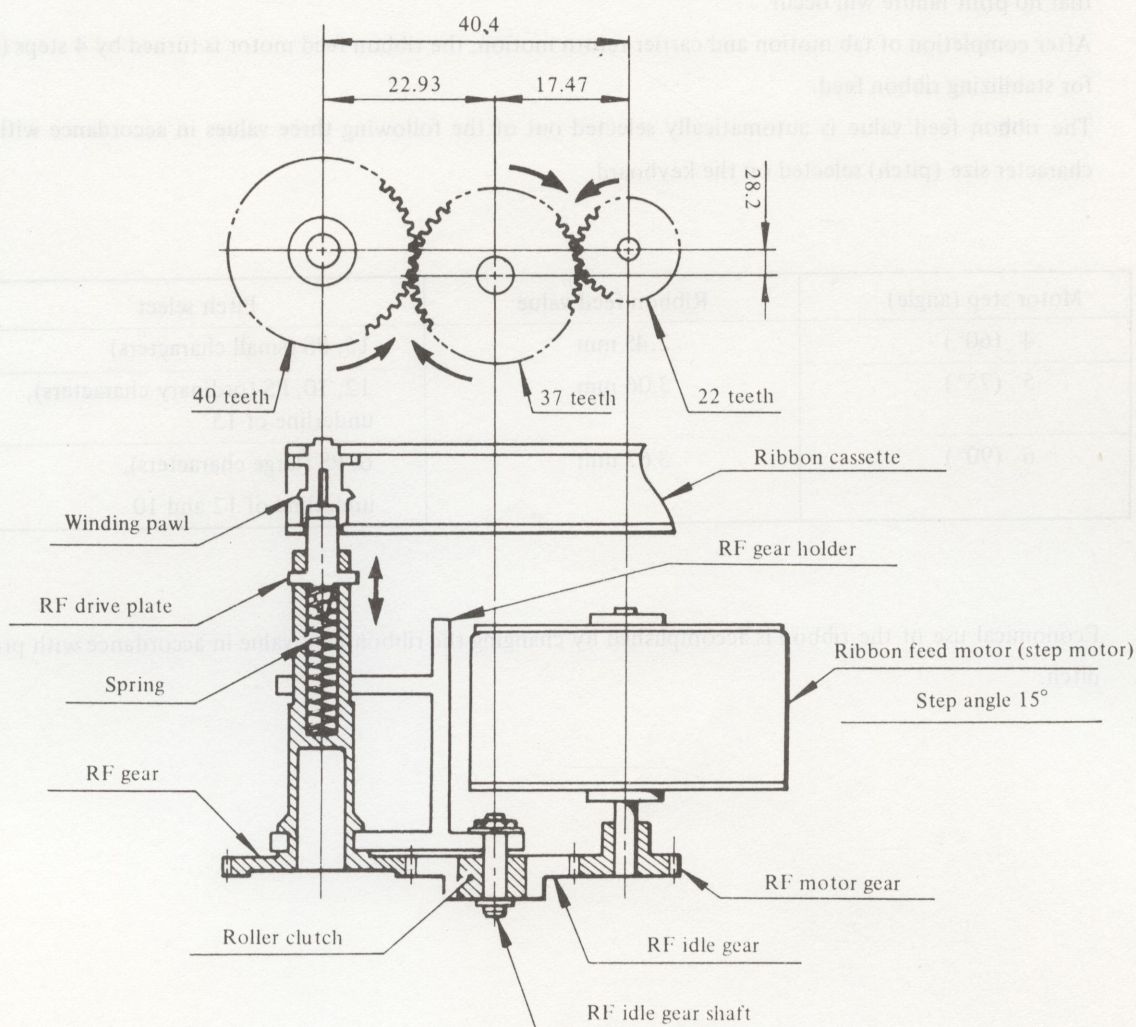
The positional relationship of the carrier motor unit components are shown below. But as adjustment using a special checker and gauge is required like the wheel motor unit, units assembled and adjusted at factory are supplied as spare parts.





### 3. RIBBON FEED MECHANISM

The ribbon feed mechanism, using a step motor as the power source, transmits the rotation of the step motor to the winding pawl in the ribbon cassette by gear drive, for feeding the ribbon.



The RF motor gear is press-fitted to the ribbon feed motor shaft for transmission of rotation of the motor to the RF idle gear.

The roller clutch is press-fitted in the bore of the RF idle gear and it rotates between the RF idle gear and the RF idle gear shaft, but it rotates in one direction only to prevent reversing.

The RF idle gear is engaged with the RF gear for transmission of rotation.



As the RF drive plate rotates together with the RF gear, the winding pawl engaged with the RF drive plate is caused to rotate to feed the ribbon.

At the time of replacement of the ribbon cassette, the RF drive plate lowers when a new ribbon cassette is mounted. As the top cover is closed, 24V DC circuit is closed and the ribbon feed motor rotates by a fixed value, allowing the RF drive plate to make engagement with the cross hole in the winding pawl by spring force.

The rotation of the ribbon feed motor at this time is 28 steps (11 full turns and 60°) or 231° in RF gear shaft rotation.

Same motion occurs after power ON and after sending of the ribbon end for making ribbon feed positive so that no print failure will occur.

After completion of tab motion and carrier return motion, the ribbon feed motor is turned by 4 steps (60°) for stabilizing ribbon feed.

The ribbon feed value is automatically selected out of the following three values in accordance with the character size (pitch) selected on the keyboard.

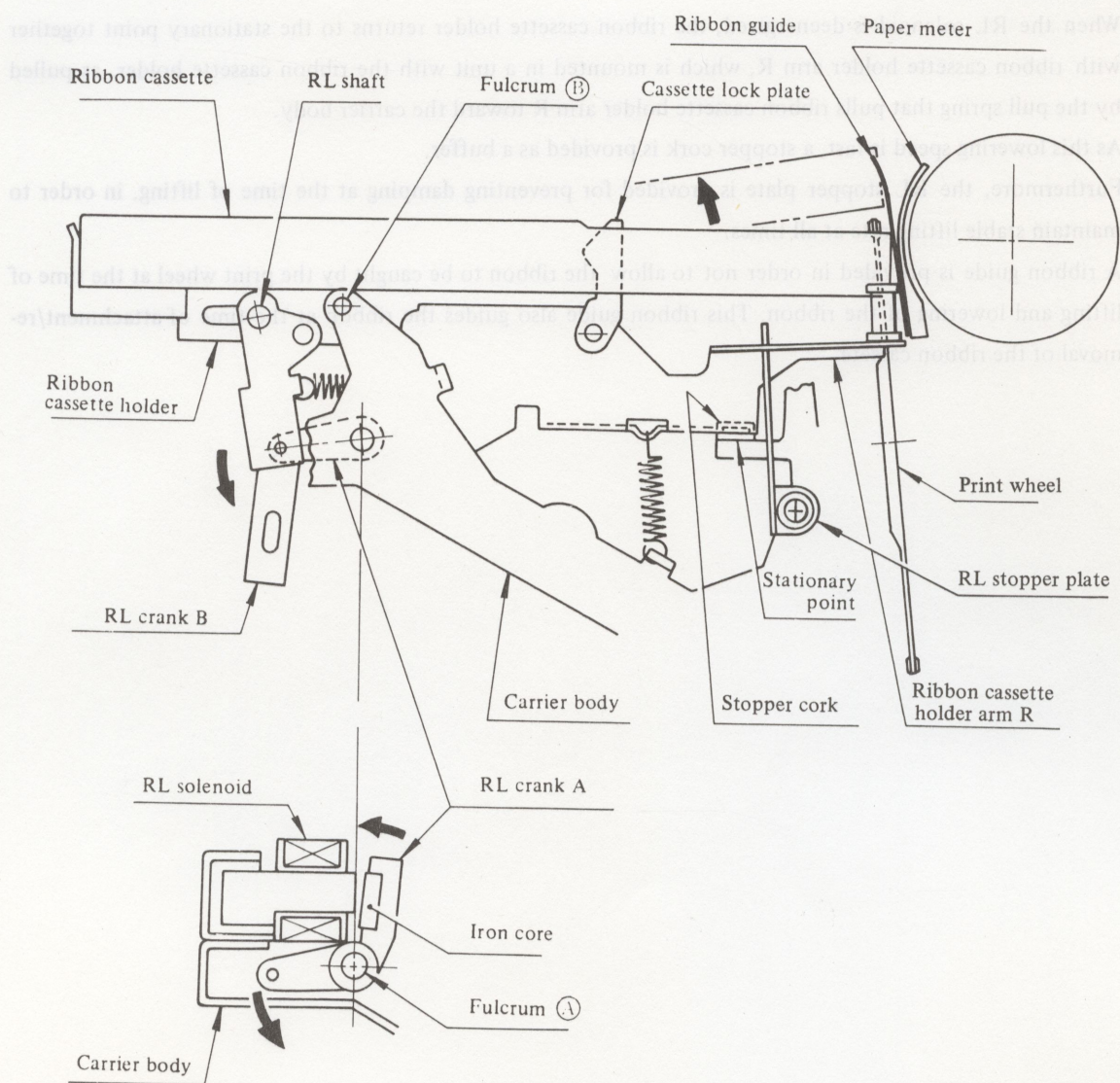
| Motor step (angle) | Ribbon feed value | Pitch select                                         |
|--------------------|-------------------|------------------------------------------------------|
| 4 (60°)            | 2.45 mm           | 15, PS (small characters)                            |
| 5 (75°)            | 3.06 mm           | 12, 10, PS (ordinary characters),<br>underline of 15 |
| 6 (90°)            | 3.67 mm           | 6, PS (large characters),<br>underline of 12 and 10  |

Economical use of the ribbon is accomplished by changing the ribbon feed value in accordance with printing pitch.



#### 4. RIBBON LIFT MECHANISM

The ribbon lift mechanism causes a solenoid of fulcrum type to suck a crank and transmits rotation of the crank to the ribbon cassette holder to lift the ribbon cassette.





When the RL (Ribbon Lift) solenoid is energized, the iron core of RL crank A is sucked, and RL crank A rotates with fulcrum ① as the center until it contacts the RL solenoid.

As RL crank A and RL crank B are connected together, RL crank B lowers by the angle of rotation of RL crank A.

RL crank B is engaged with the cam groove in the ribbon cassette holder, and the ribbon cassette holder rotates by the value equivalent to lowering of RL crank B with fulcrum ② as the center.

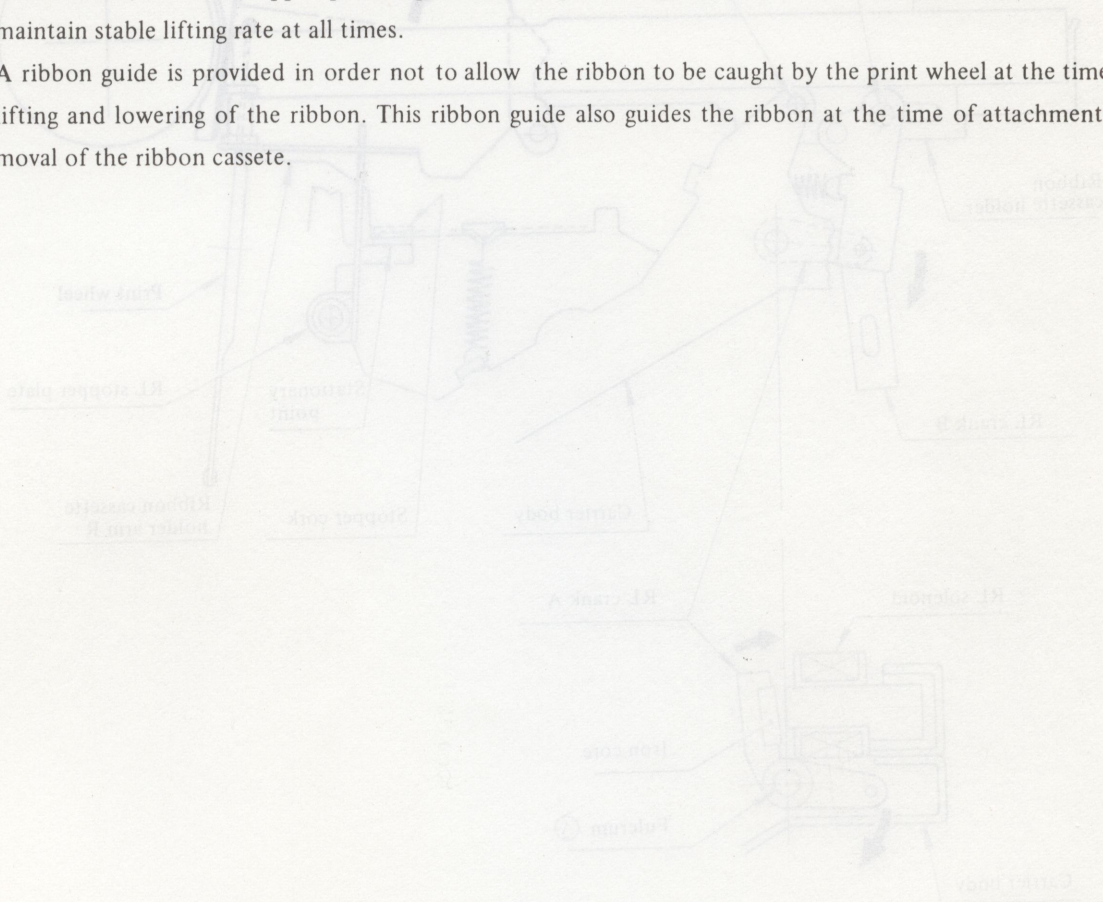
As the ribbon cassette holder holds a ribbon cassette by the cassette lock plate, the ribbon is lifted and printing is performing.

When the RL solenoid is deenergized, the ribbon cassette holder returns to the stationary point together with ribbon cassette holder arm R, which is mounted in a unit with the ribbon cassette holder, as pulled by the pull spring that pulls ribbon cassette holder arm R toward the carrier body.

As this lowering speed is fast, a stopper cork is provided as a buffer.

Furthermore, the RL stopper plate is provided for preventing damping at the time of lifting, in order to maintain stable lifting rate at all times.

A ribbon guide is provided in order not to allow the ribbon to be caught by the print wheel at the time of lifting and lowering of the ribbon. This ribbon guide also guides the ribbon at the time of attachment/removal of the ribbon cassette.





## 5. CORRECTION MECHANISM

The correction mechanism can be divided into the correction lift mechanism that lifts the correction tape and the correction feed mechanism that feeds the correction tape.

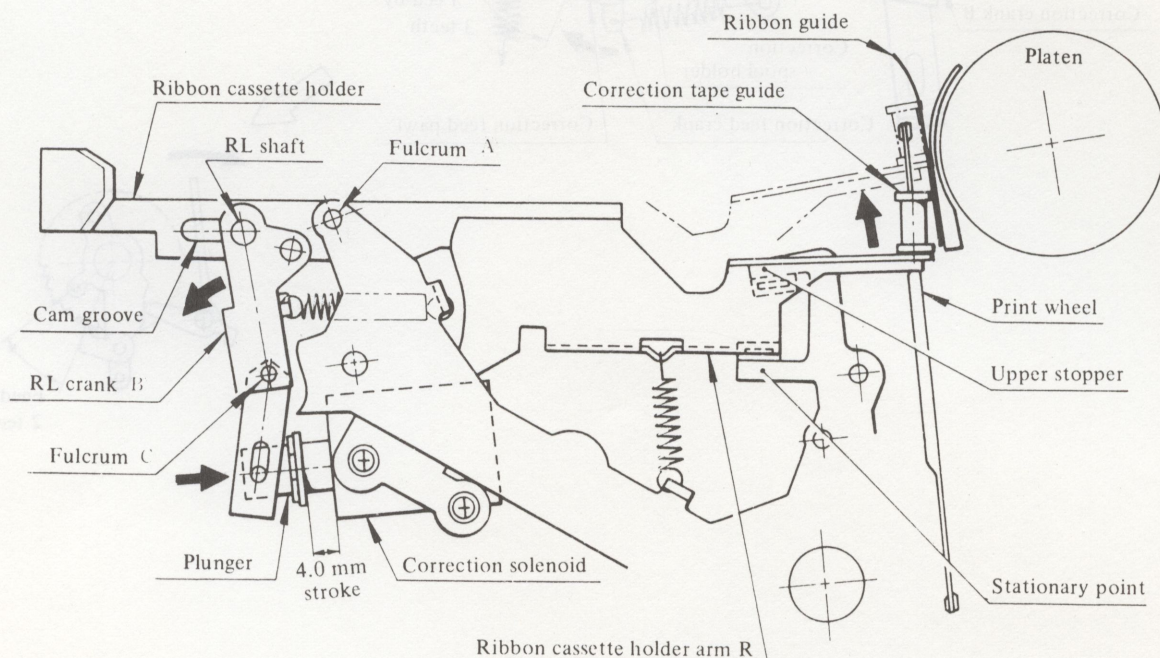
### 5.1 Correction lift mechanism

The plunger is pulled when the correction solenoid is energized in the state where the ribbon cassette is lifted to the lifted position by the ribbon lift motion described in section 4 above.

The plunger is coupled to RL crank B, which rotates with fulcrum C as the center.

As the RL shaft, which is unitized with RL crank B, slides along the cam groove in the ribbon cassette holder, the ribbon cassette holder is further lifted beyond the ribbon lift position with fulcrum B as the center and contacts the upper stopper of the carrier body. This position is the correction lift position.

When the RL solenoid and correction solenoid are deenergized, RL crank B returns as pulled by its pull spring, and the ribbon cassette holder returns to the stationary point as pulled by the pull spring for ribbon cassette holder arm R.



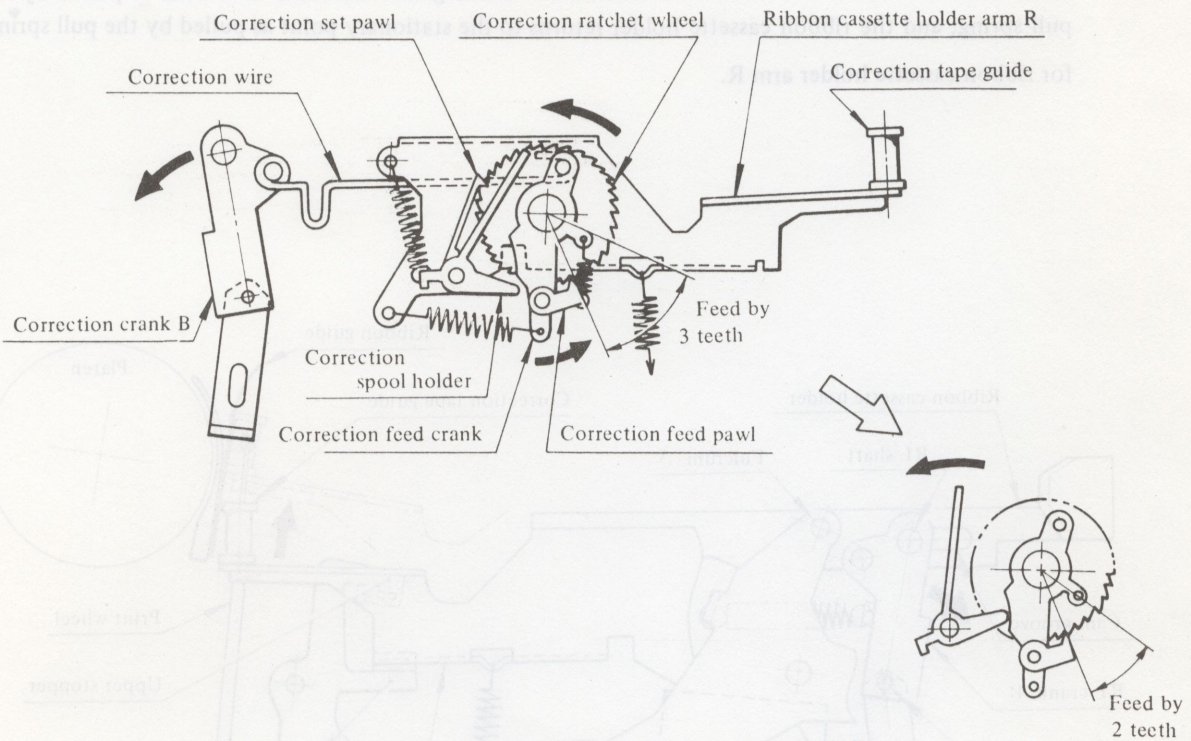


## 5.2 Correction feed mechanism

RL crank B rotates by the correction lift motion.

As the correction feed crank is connected through the correction wire with RL crank B, the correction feed crank rotates by the extent of rotation of RL crank B.

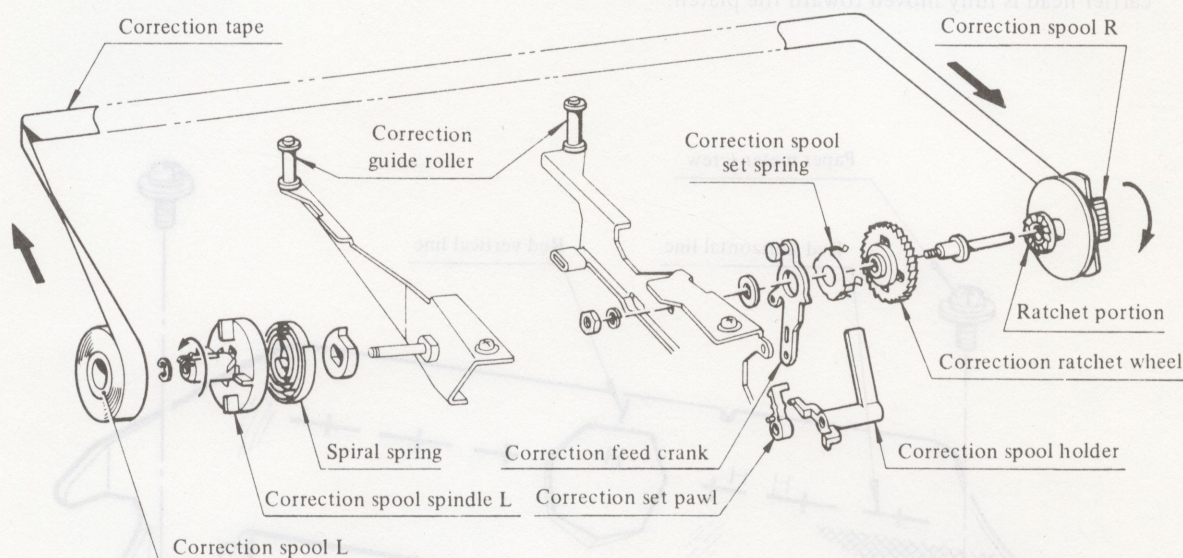
By the rotation of the correction feed crank, the correction ratchet wheel is rotated by a suitable value by the correction feed pawl, for feeding the correction tape.



The correction spool holder senses the wound diameter of the correction tape and changes the number of teeth of the correction ratchet wheel for feeding the correction tape by changing the start position of the correction feed crank. Three teeth feed is made at the beginning, and switching is made to two teeth when the wound diameter increases to a certain level.

Simulated constant length feed is made by changing the number of teeth for tape feed. As a result, wasting of the correction tape is reduced and the correction tape can be used economically.





The ratchet portion of the correction ratchet wheel is engaged with the ratchet portion of correction spool R, and correction spool R is held by correction spool set spring.

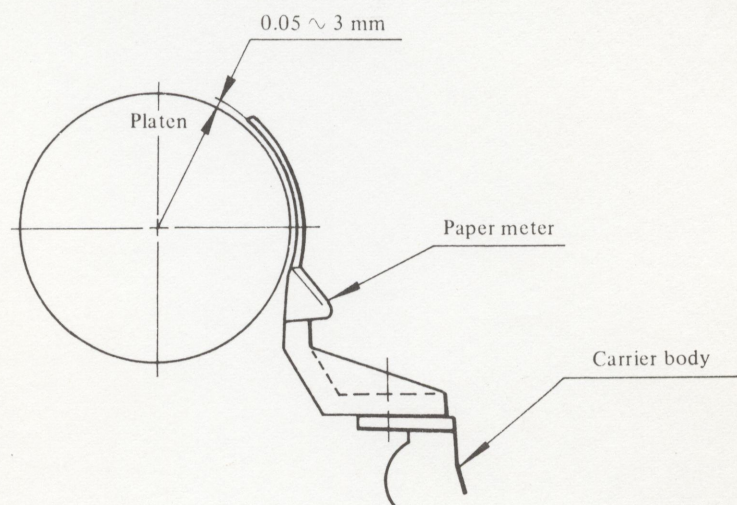
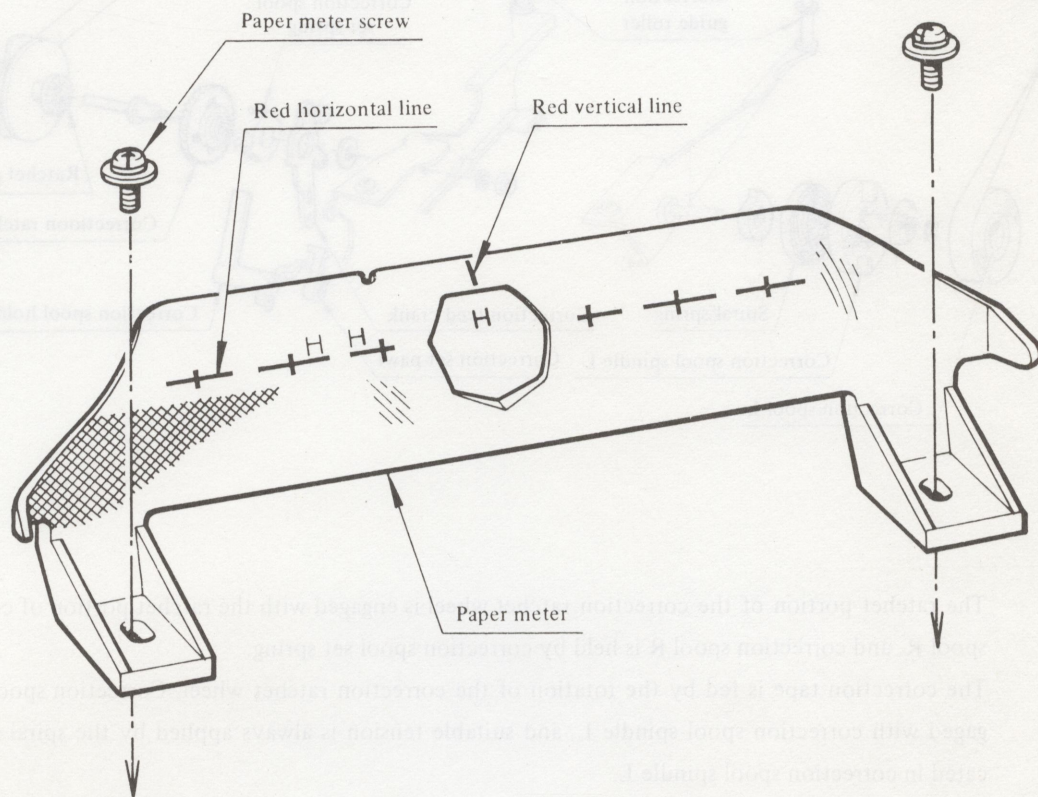
The correction tape is fed by the rotation of the correction ratchet wheel. Correction spool L is engaged with correction spool spindle L, and suitable tension is always applied by the spiral spring located in correction spool spindle L.



## 6. PAPER METER

The paper meter has a red vertical line and a red horizontal line which make it possible to bind the center of printing and the lower part of standard characters (H, for instance).

The clearance between the paper meter and the platen is very important for positively holding the paper against the platen. Make adjustment by mounting screws so that the clearance is  $0.05 \sim 0.3 \text{ mm}$  when the carrier head is fully moved toward the platen.





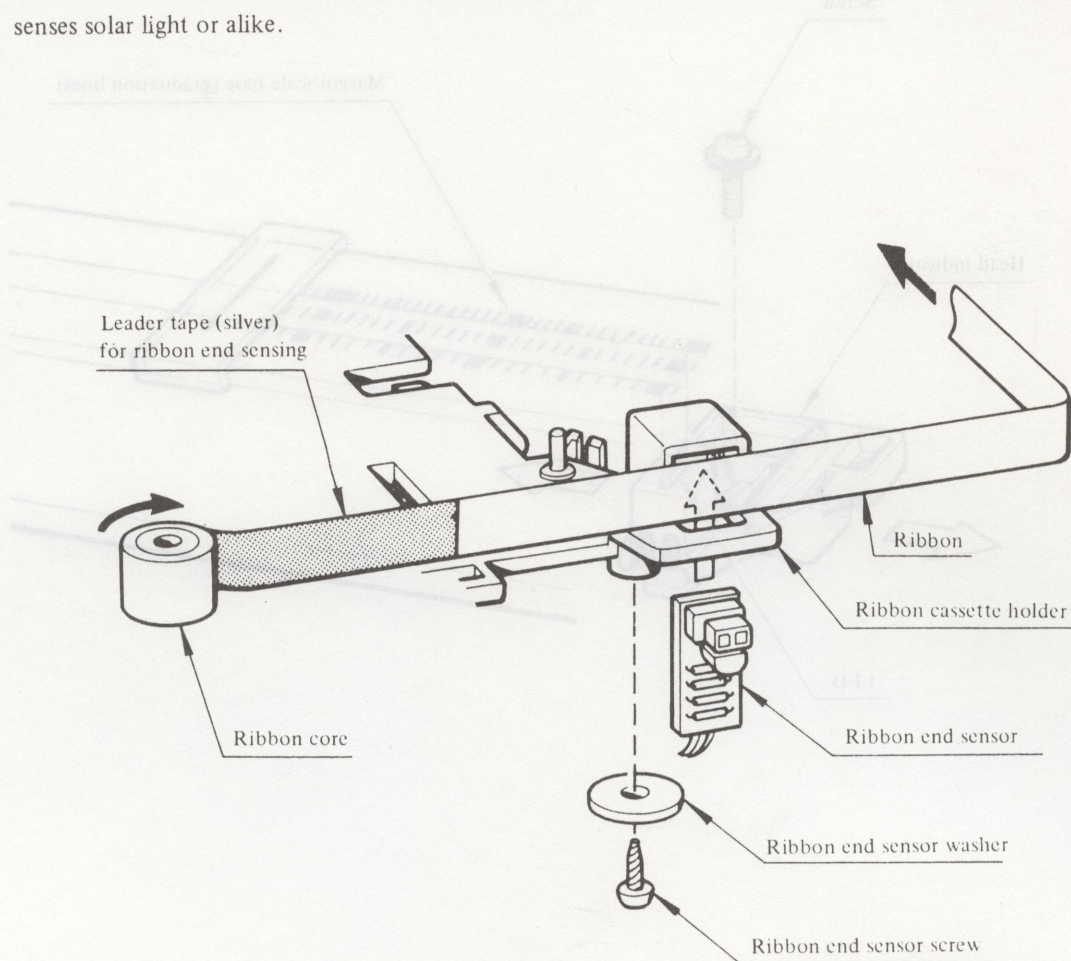
## 7. RIBBON END SENSOR

The ribbon end sensor senses end of the tape during printing operation to prevent failure in printing.

“RIBBON END” message is displayed on the display and input through the keyboard is disabled as soon as the ribbon end is sensed.

The ribbon end sensor is of reflection type. It senses the end of a correctable ribbon, one time ribbon and multi-use ribbon, but it does not sense the end of a fabric ribbon because it is endless.

In the state where the ribbon cassette is removed, basically the ribbon end sensor does not work and input through the keyboard can be made. Because the sensor is of reflection type, there are rare cases where it senses solar light or alike.

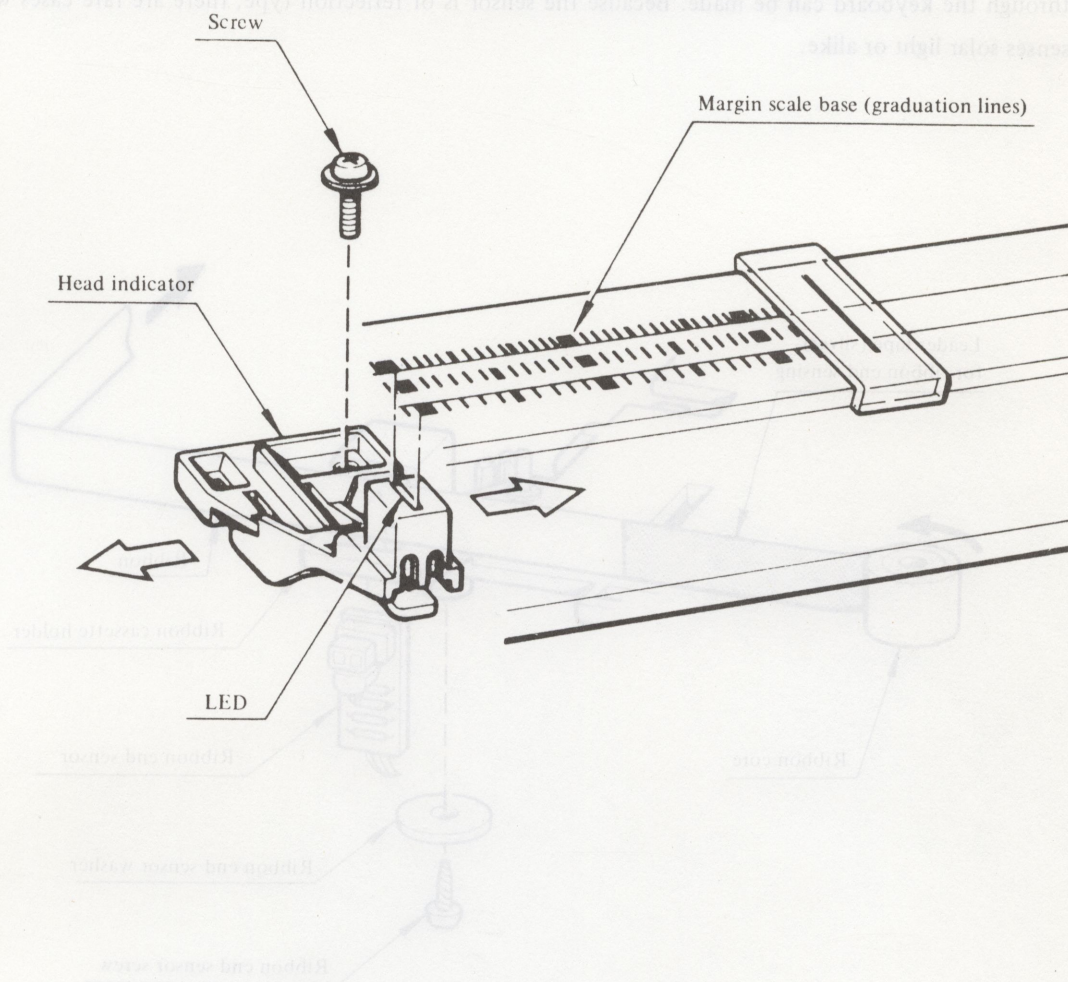




## 8. HEAD INDICATOR

The head indicator is fixed to the carrier body and the center position of the carrier head can be learned by reading the graduation line in the margin scale base at the point where the red LED is lit.

The LED of the head indicator is always lit while the power is ON.



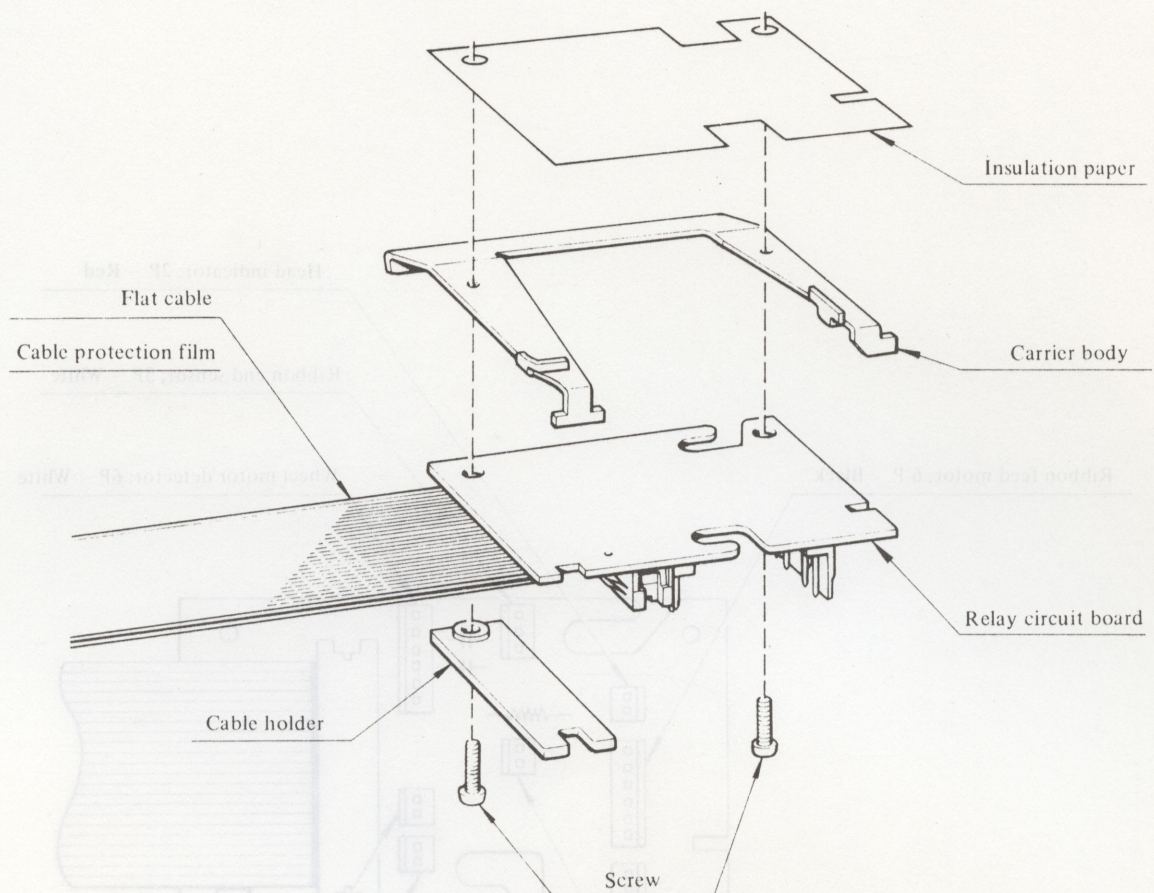


## 9. RELAY CIRCUIT BOARD

Within the carrier head, there are where motor and its detector, print hammer solenoid, ribbon feed motor, ribbon lift solenoid, correction solenoid, ribbon end sensor and head indicator.

What is used for gathering together lead wires of these various mechanisms and connecting them to the flat cable is the relay circuit board.

The composition related to the relay circuit board is as follows.



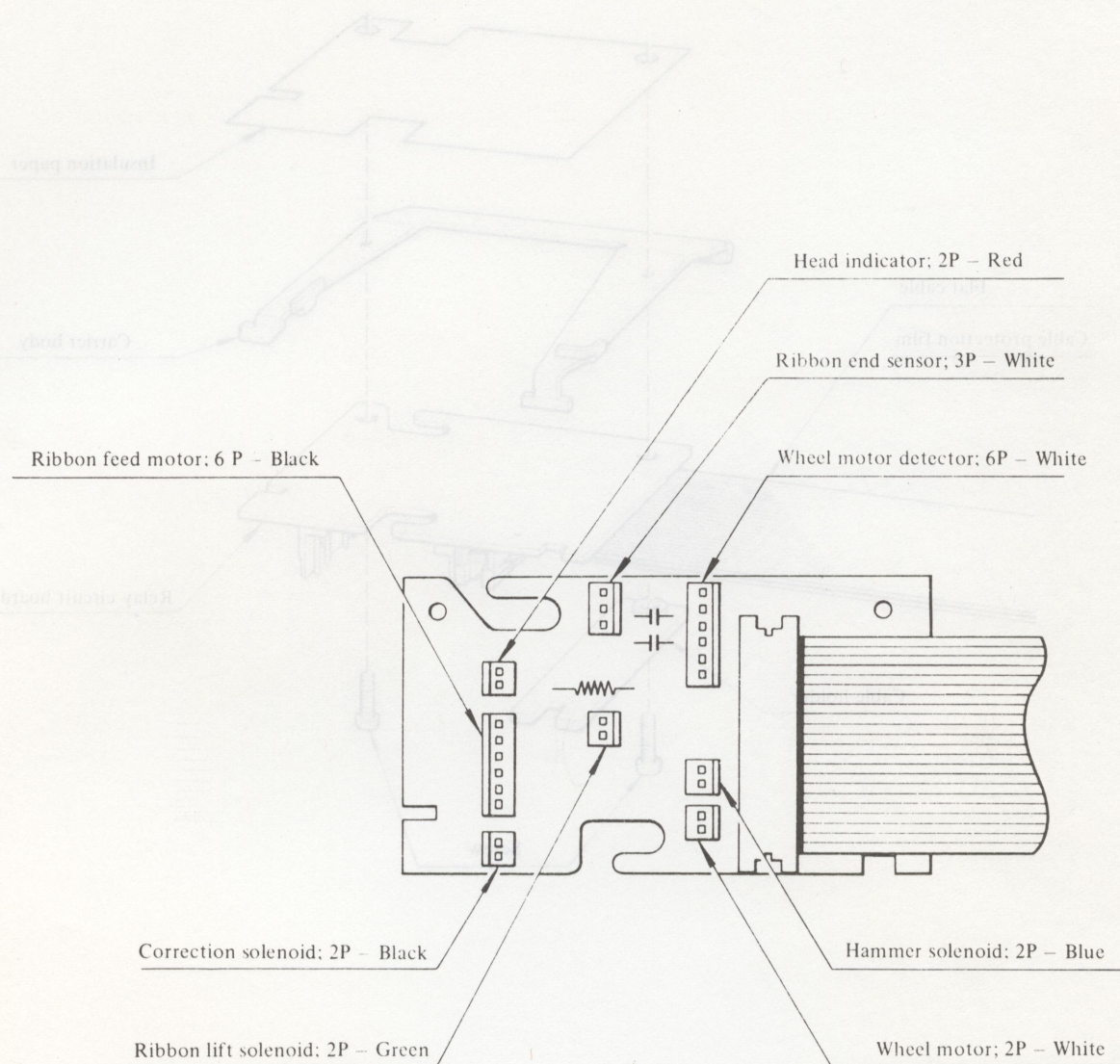


The relay circuit board is equipped with the following eight connectors, and connection of lead wires to these connectors is made with number of pins and colors matched.

It is recommended that connection of lead wires to connectors is made in the following sequence for obtaining good positional relations of lead wires.

1 → 2 → 3 → 4 → 5 → 6 → 7 → 8

J21 J23 J22 J27 J26 J24 J28 J25





## 10. PLATEN

Attachment/removal of the platen to/from the chassis is easy, and is convenient for cleaning of the paper meter and other parts.

The construction of the platen is as shown below. Platen bearings on RH side and LH side are held by the chassis in such a manner that the platen can be rotated. Platen bearing L has a groove for maintaining positional relationship with the chassis, and this groove fits with the chassis.

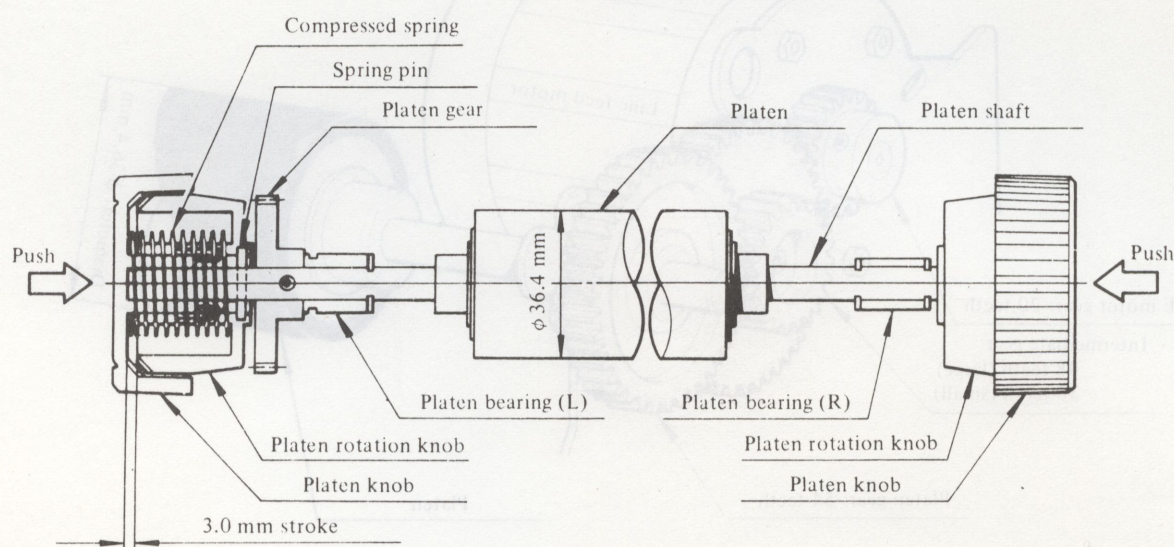
The platen gear for transmission of rotation of the line feed motor is located on the left-hand side, and the platen gear is firmly fixed to the platen shaft by set screws.

Both RH and LH platen knobs can be freely rotated with respect to the platen shaft, and the platen does not rotate even if these platen knobs are rotated in regular positions.

Each platen knob is pushed outward by means of a compressed spring, and the platen rotation knob is engaged with pawls of the platen knob when the platen is pushed inward. As the platen rotation knob is fixed to the platen shaft by means of a spring pin, the platen rotates together with the platen knob when the platen knob is turned in the state where it is pushed inward.

The relationship between the platen knob and the platen rotation knob is symmetrical between RH side and LH side.

Platen rotation is provided with detent effect by excitation of the line feed motor and it is possible to feed the paper in 1/48 inch steps on the platen. Details are described in Section 11.





## 11. PLATEN DRIVE MECHANISM

The platen drive mechanism rotates the platen with rotation of the step motor (line feed motor) transmitted through gears.

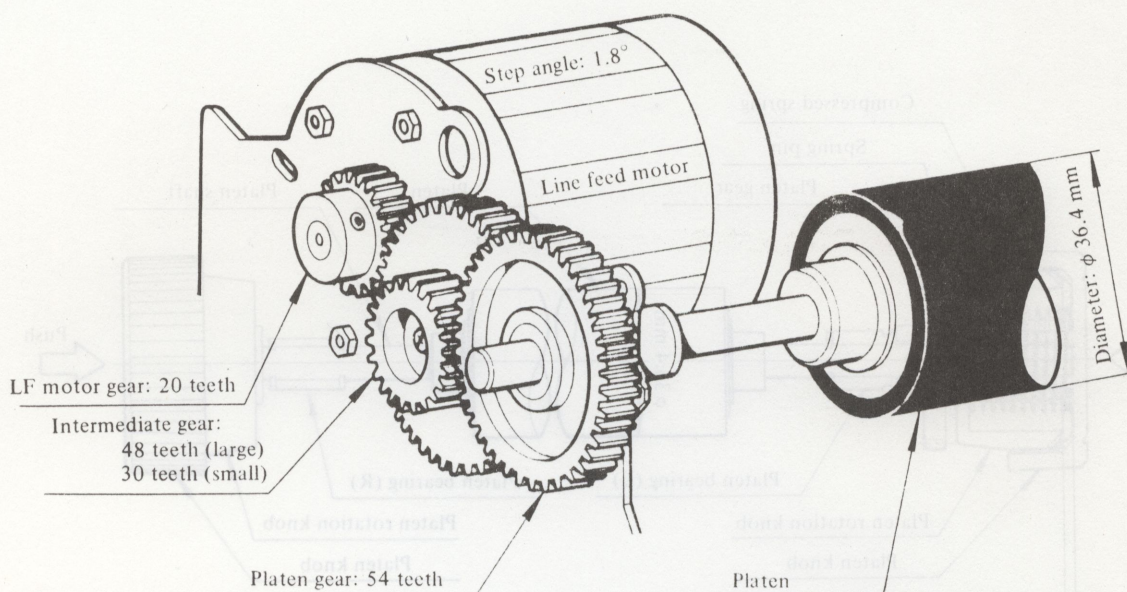
The LF motor gear is attached to the line feed motor fixed to the chassis. When the line feed motor rotates, the intermediate gear is driven by the LF motor gear, the platen gear is driven next, and the platen is driven as a result.

The step angle of the line feed motor is  $1.8^\circ$  and one rotation is of 200 steps. The gear ratio has been selected so that one step of the line feed motor is equivalent to a motion of  $1/192$  inch on the platen surface.

Although the minimum line feed through keyboard operation is  $1/12$  inch on the platen surface, it is possible to make fine feed of  $1/48$  inch by manually operating the platen as described earlier.

Although a strong holding force is applied to the line feed motor by exciting force during operation of the line feed motor and also during hammering operation, a weak holding force only is applied to the line feed motor when its operation is suspended.

Accordingly, the platen can be turned by hand with a suitable detent feeling to the hand.





## 12. PAPER FEED/PAPER RELEASE MECHANISM

- (1) Paper feed rollers for applying suitable tension to the paper are provided in order to correctly feed the paper accompanying rotation of the platen.

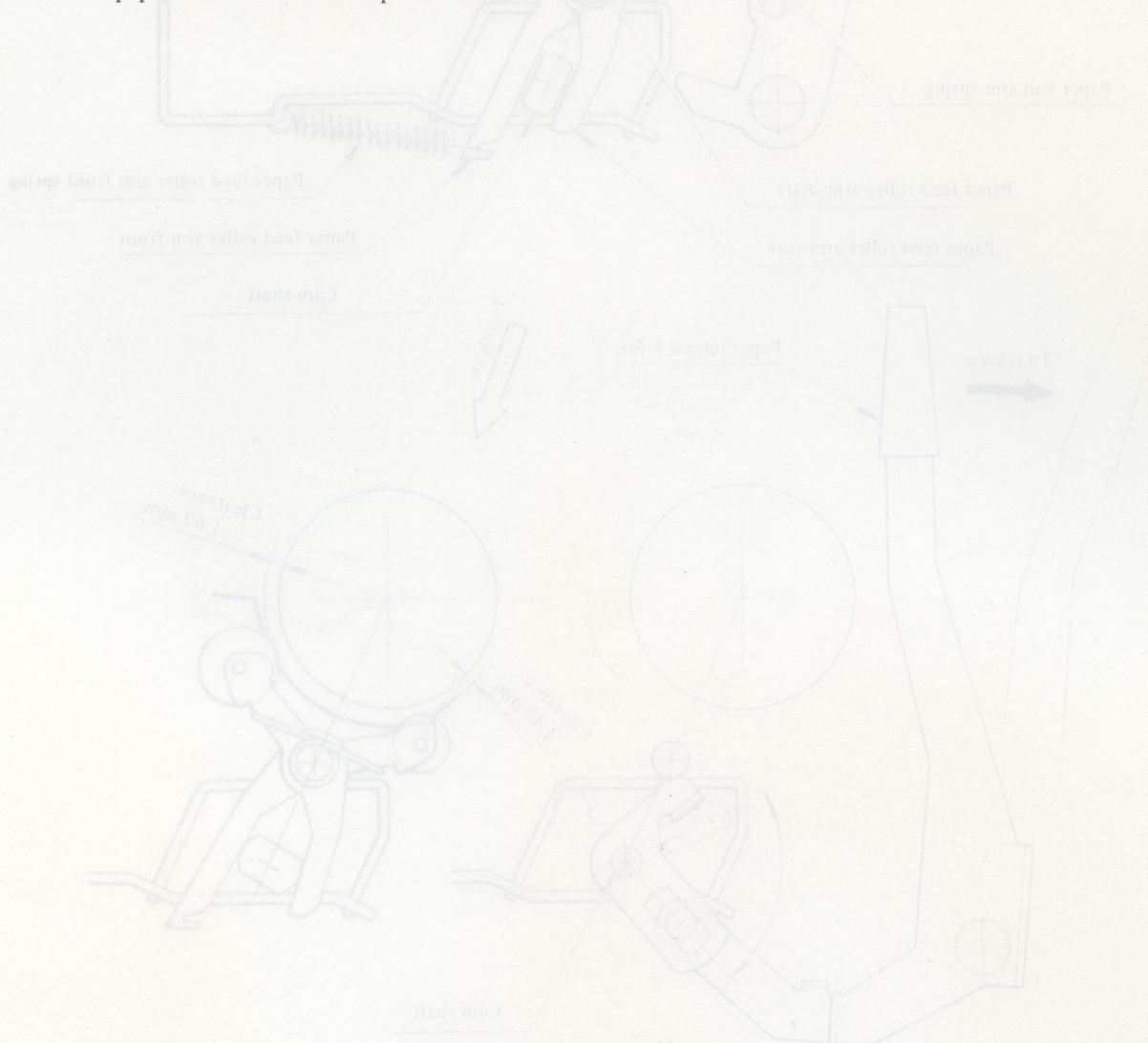
Paper feed rollers are mounted to paper feed roller arms. They apply pressure to the platen surface by means of torsion springs with the paper feed roller arm shaft as the fulcrum.

Paper feed rollers are provided on both front side and rear side, and the pressure of paper feed roller arms front is slightly reduced by using pull springs in order to stabilize paper feed particularly at the time when multiple sheets of paper are used for copying.

Paper bail rollers also apply a suitable pressure to the platen surface by means of springs on paper bail arms, for preventing sagging of the paper and for positively feeding out the paper.

- (2) It is necessary to release the tension of paper feed rollers at occasions of insertion of papers and for repositioning the paper, which was diagonally fed by mistake, to a correct position.

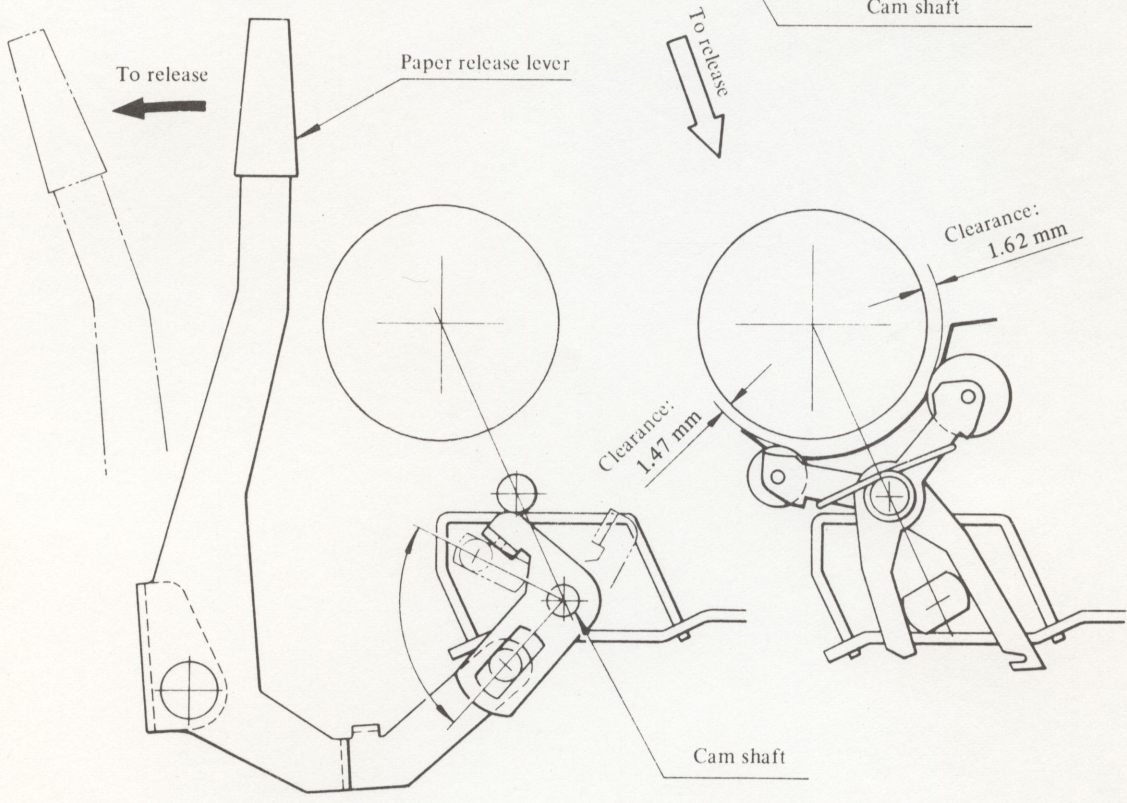
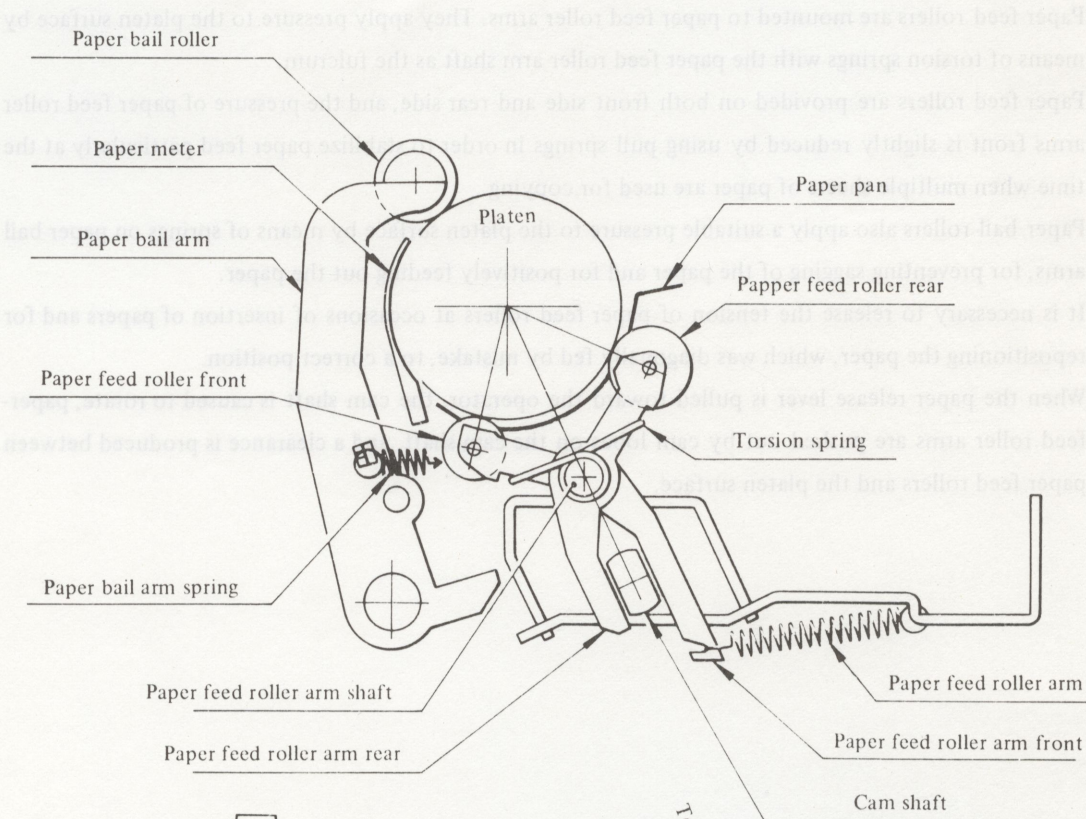
When the paper release lever is pulled toward the operator, the cam shaft is caused to rotate, paper-feed roller arms are pushed out by cam lobes on the cam shaft, and a clearance is produced between paper feed rollers and the platen surface.





12. PAPER FEED/PAPER RELEASE MECHANISM

(1) Paper feed rollers for applying suitable tension to the paper are provided in order to correctly feed the paper accompanying rotation of the platen.





### 13. COPY CONTROL MECHANISM

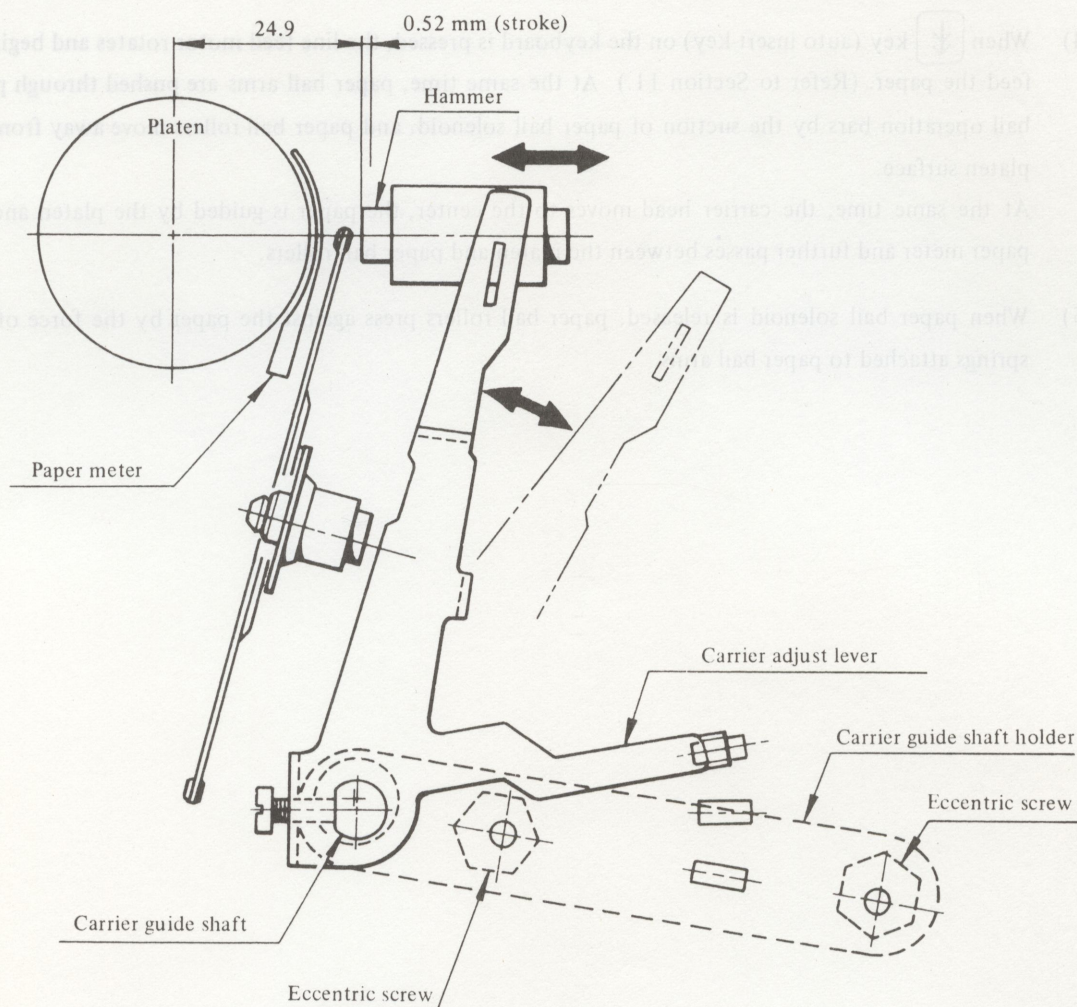
It is possible to change the clearance between the paper meter and the platen surface in three steps in correspondence to the number of copies and paper thickness, and control is made by means of the carrier adjust lever.

When the number of copies is small and paper thickness is thin, for instance, reduce the clearance between the paper guide and the platen surface to eliminate sagging of the paper.

When the number of copies is large and the paper thickness is thick, on the other hand, increase the clearance between the paper meter and the platen surface to produce the condition identical to the case where the number of copies is small.

The platen is fixed to the chassis and the paper meter is fixed to the carrier body. The carrier guide shaft that supports the carrier body is eccentric and the carrier adjust lever is attached to it.

When the carrier adjust lever is moved back and forth, the paper meter moves back and forth by the eccentricity of the carrier guide shaft, and thus the clearance between the paper meter and the platen surface can be controlled.



The carrier guide shaft is held by carrier guide shaft holders. It is necessary to adjust the carrier guide shaft in the correct position by using eccentric screws tightening carrier guide shaft holders.



## 14. AUTOMATIC PAPER INSERTION MECHANISM

This mechanism is used for automatically setting the paper in the printing position. Cause it to operate in the following steps.

- (1) Pull the paper release lever to this side.

The cam shaft rotates and paper release state is produced. (Refer to Section 12 for details.)

At this time paper stopper arms which are in contact with the cam shaft rotate with the paper feed roller arm shaft as the center by the force of torsion springs, as the cam shaft rotates.

As paper stoppers are engaged with paper stopper arms, they are forced against the platen surface as a result of the motion stated above.

- (2) When the paper is inserted into the space between the platen and paper feed roller with the paper pan used as the guide, it is stopped by paper stoppers, and at the same time is aligned in parallel with the platen.

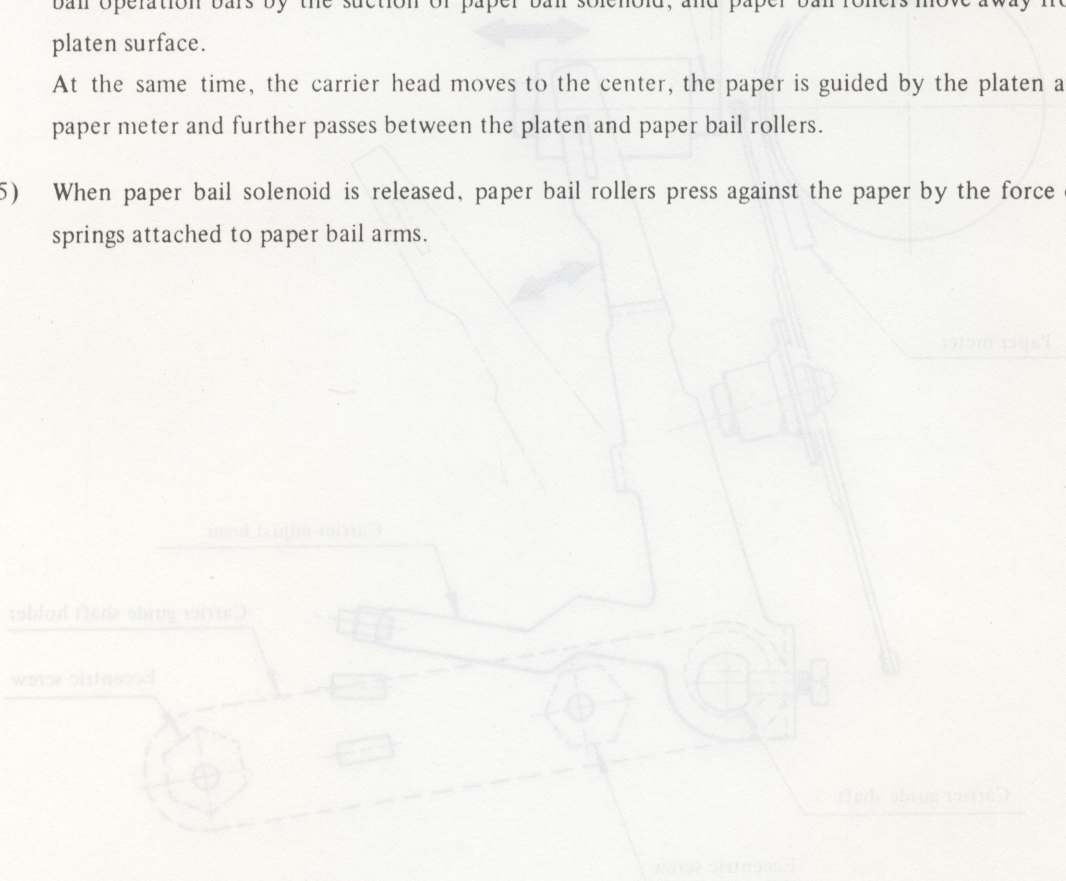
- (3) When the paper release lever is returned, the paper is held by paper feed rollers rear.

As paper stoppers move away from the platen surface, it becomes possible to feed the paper.

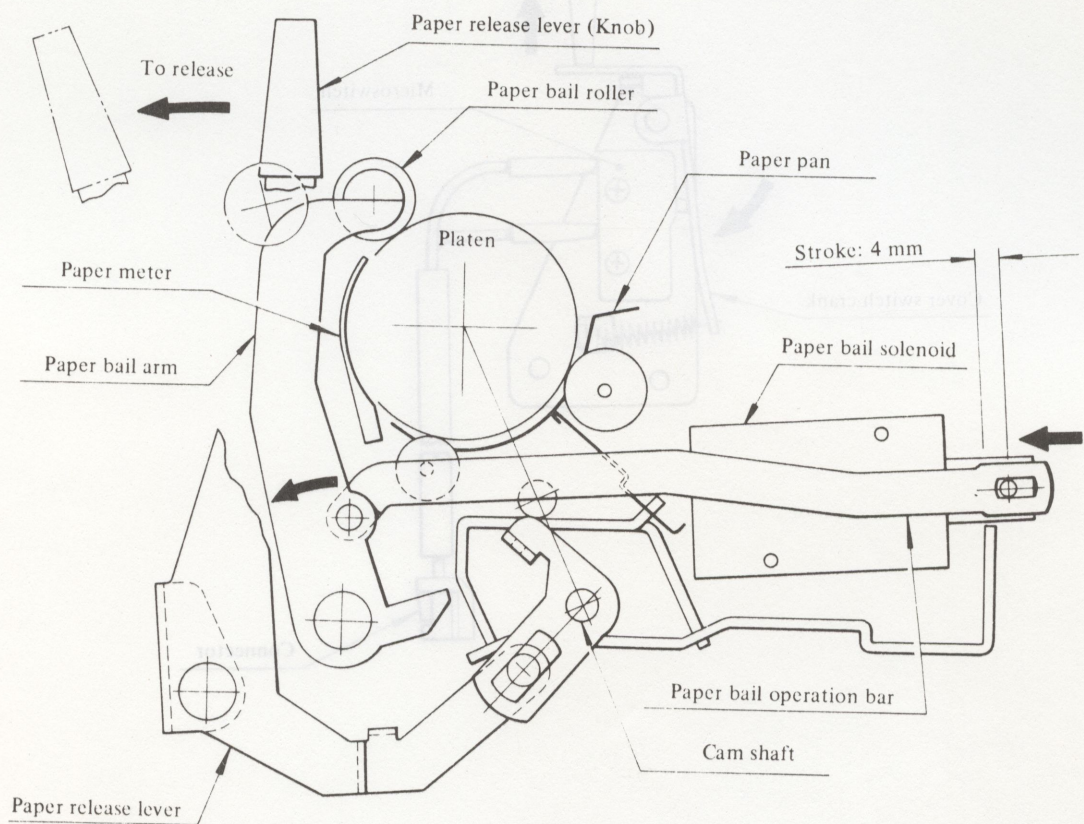
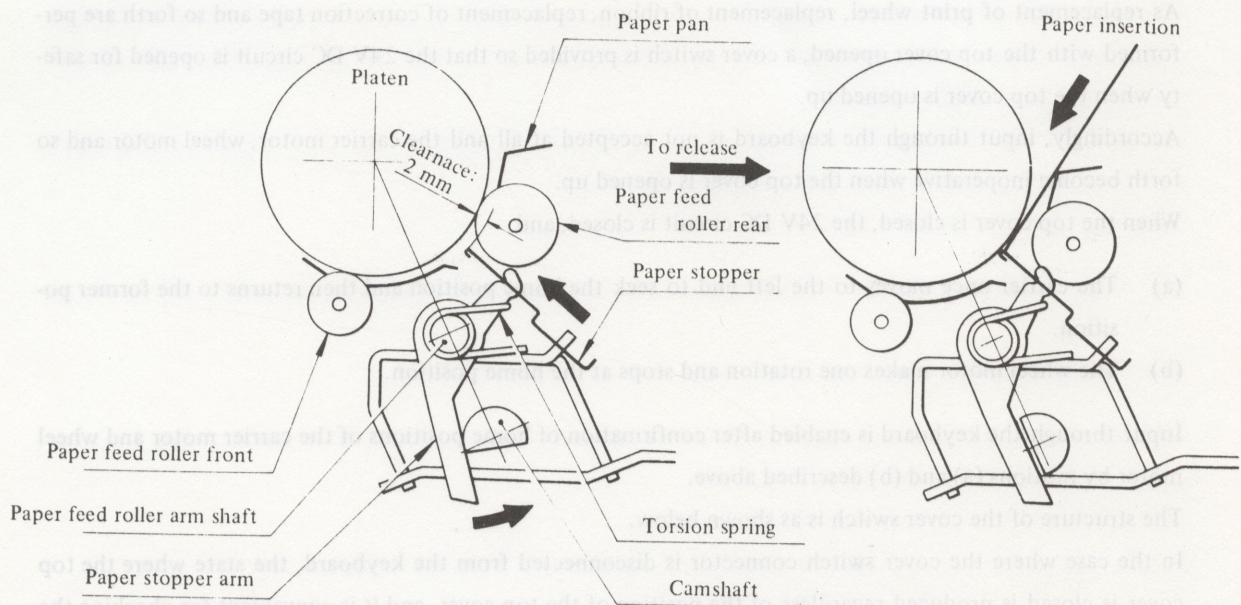
- (4) When  key (auto insert key) on the keyboard is pressed, the line feed motor rotates and begins to feed the paper. (Refer to Section 11.) At the same time, paper bail arms are pushed through paper bail operation bars by the suction of paper bail solenoid, and paper bail rollers move away from the platen surface.

At the same time, the carrier head moves to the center, the paper is guided by the platen and the paper meter and further passes between the platen and paper bail rollers.

- (5) When paper bail solenoid is released, paper bail rollers press against the paper by the force of pull springs attached to paper bail arms.









## 15. COVER SWITCH

As replacement of print wheel, replacement of ribbon, replacement of correction tape and so forth are performed with the top cover opened, a cover switch is provided so that the 24V DC circuit is opened for safety when the top cover is opened up.

Accordingly, input through the keyboard is not accepted at all and the carrier motor, wheel motor and so forth become inoperative when the top cover is opened up.

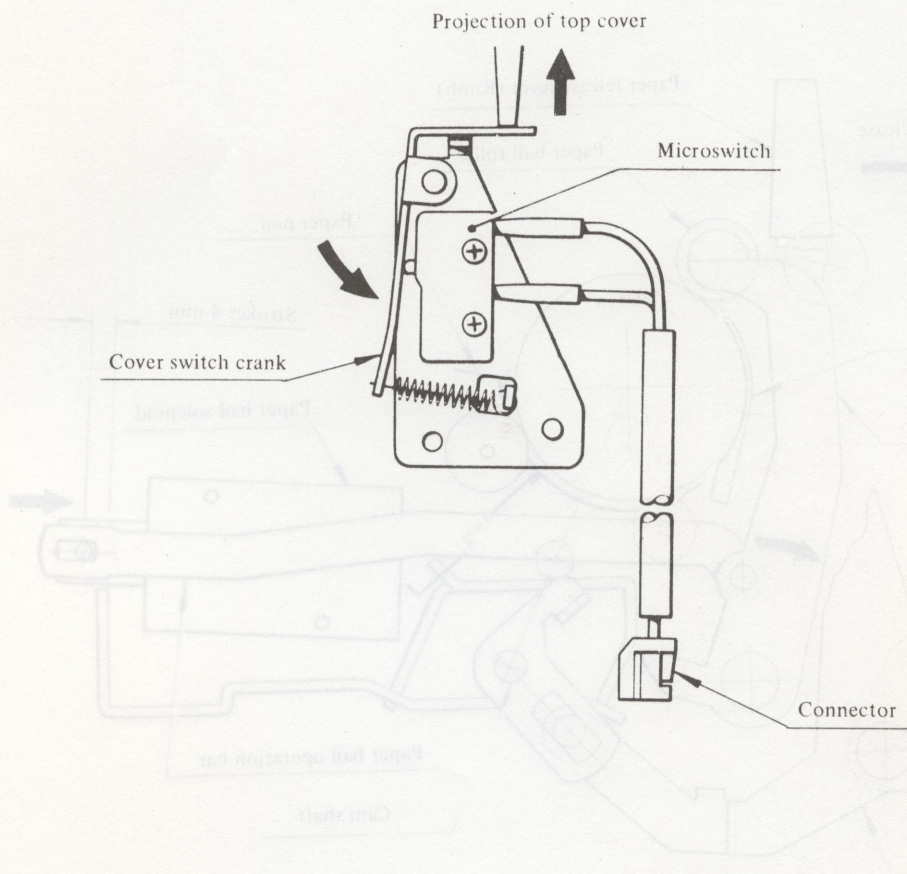
When the top cover is closed, the 24V DC circuit is closed, and

- (a) The carrier once moves to the left end to seek the home position and then returns to the former position.
- (b) The wheel motor makes one rotation and stops at the home position.

Input through the keyboard is enabled after confirmation of home positions of the carrier motor and wheel motor by motions (a) and (b) described above.

The structure of the cover switch is as shown below.

In the case where the cover switch connector is disconnected from the keyboard, the state where the top cover is closed is produced regardless of the position of the top cover, and it is convenient for checking the machine in the state where the cover is opened up.





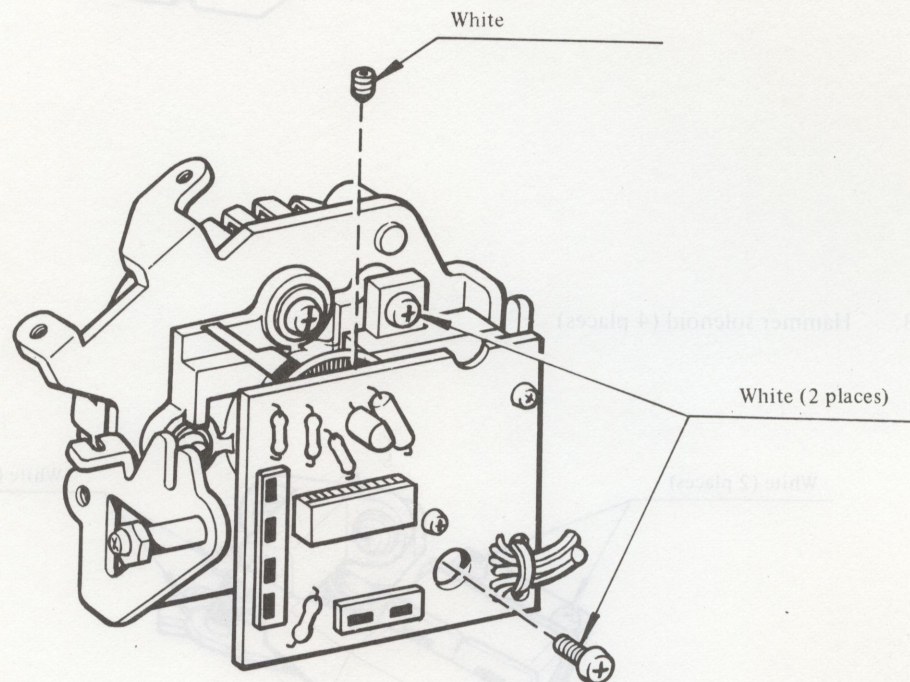
### 3 APPLICATION OF WHITE LOCK PAINT

The screws to which white lock paint is applied are points adjusted using special checkers and gauges at factory and therefore, they should never be loosened.

The point at which white lock paint is applied are as follows.

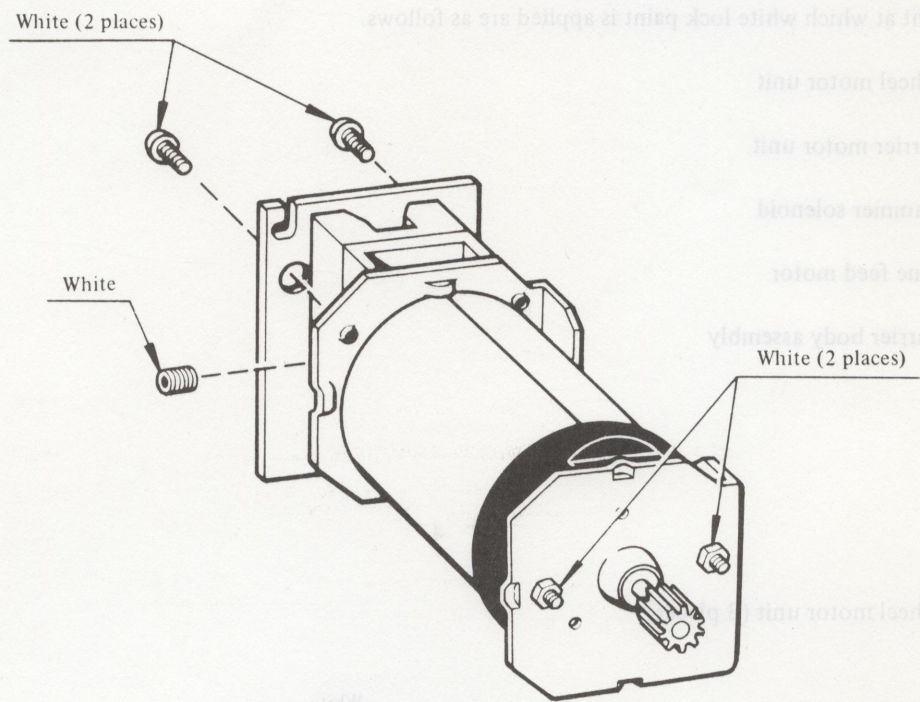
1. Wheel motor unit
2. Carrier motor unit
3. Hammer solenoid
4. Line feed motor
5. Carrier body assembly

1. Wheel motor unit (3 places)

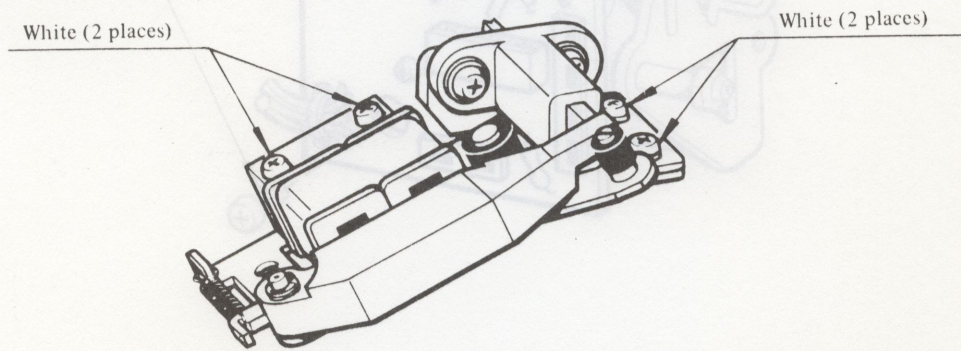




2. Carrier motor unit (5 places)

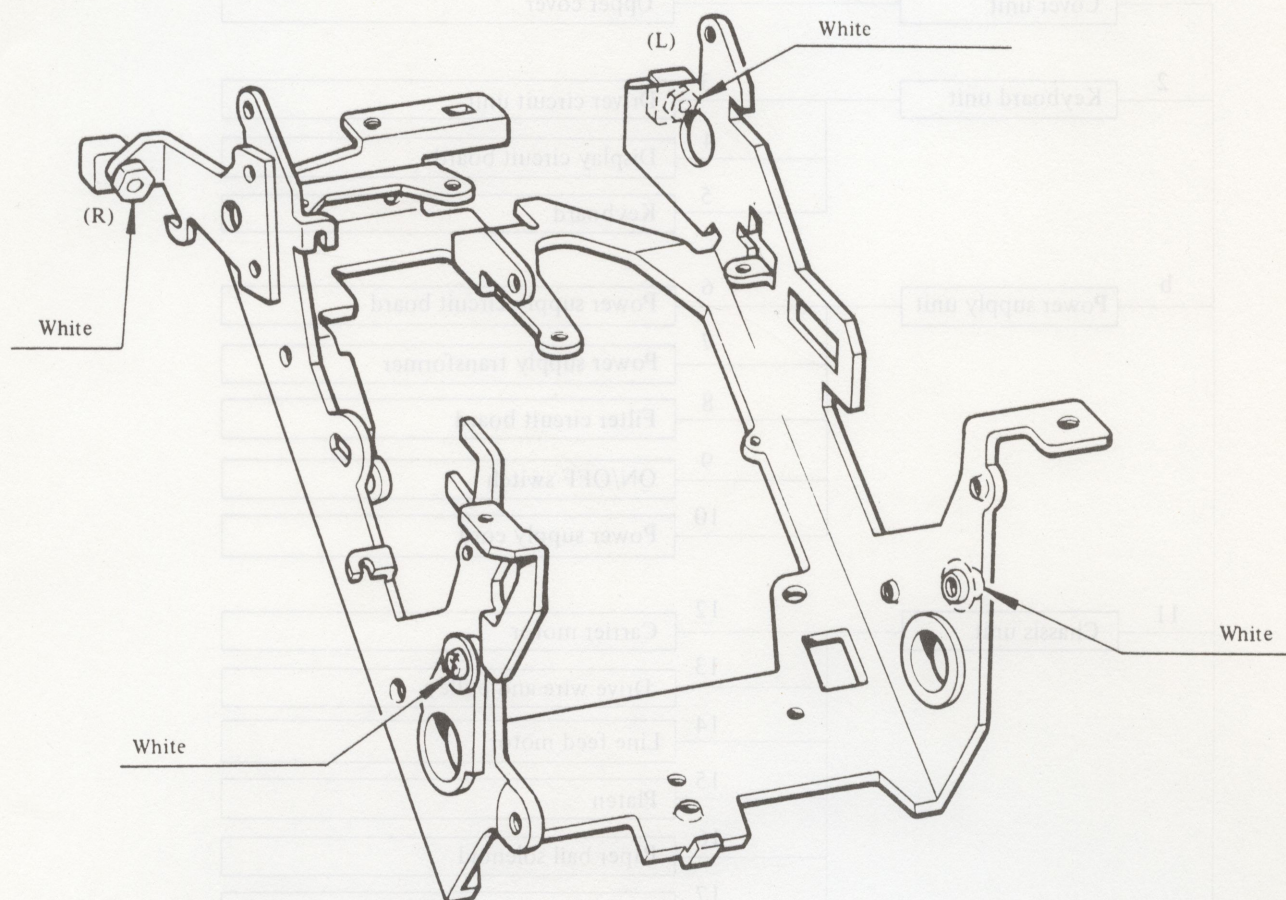


3. Hammer solenoid (4 places)





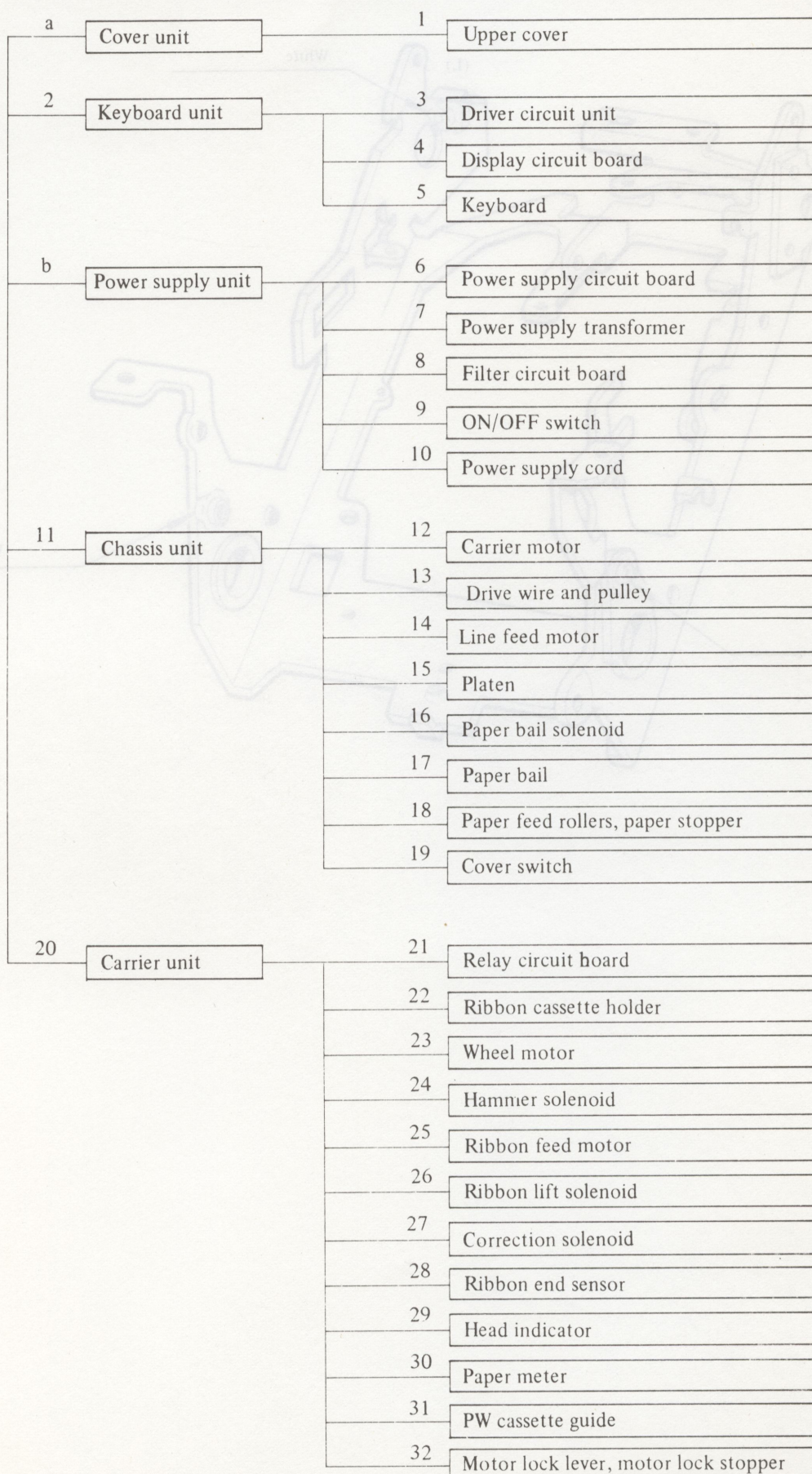
## 4. Carrier body assembly (4 places)





## 4 MAINTENANCE

## 1. INDEX FOR REMOVAL/ATTACHMENT AND ADJUSTMENT PROCEDURES





## 1. UPPER COVER

### 1.1 Removal

(1) Removal of paper supporter

Remove the paper supporter by pulling it upward. (Fig. 1-2)

(2) Removal of platen

Open the top cover, cause the carrier to move the center position, erect the paper rest, push R and L platen holders downward and then remove the platen. (Fig. 1-2)

(3) Removal of screws

Remove four screws. (Fig. 1-2)

(4) Removal of upper cover

Remove three latches that connect the upper cover to the lower cover and then remove the upper cover by lifting it upward. (Fig. 1-2)

### 1.2 Attachment

Attachment is reverse order of removal.

NOTE:

For safety, after power supply cord is pulled out, make the removal, the attachment and adjustment.

### 1.3 Adjustment and Checks

(1) Engagement of latches that connect upper cover and lower cover

Latches at three places should be positively engaged. (Fig. 1-2)

(2) Removal/Attachment of platen

Cause the carrier unit to move to the center position before removal/attachment of the platen.

At the time of attachment, the groove in platen bearing L should be positively engaged with the holder of the chassis. (Fig.1-1)

(3) Head indicator

The LED in the head indicator should be matched with a graduation on the margin scale base. Refer to Section 29 "HEAD INDICATOR" for details.

(4) Cover switch

The cover switch should normally works.

Refer to Section 19 "COVER SWITCH" for details.



- (5) Before checking the machine

When it is wanted to check the machine in the state where the upper cover is removed, disconnect the connector of the cover switch from the driver circuit board.

Refer to Section 2 "KEYBOARD UNIT" regarding details of connection/disconnection of the connector.

#### 1.4 Tools

Plus Driver (NO-1)

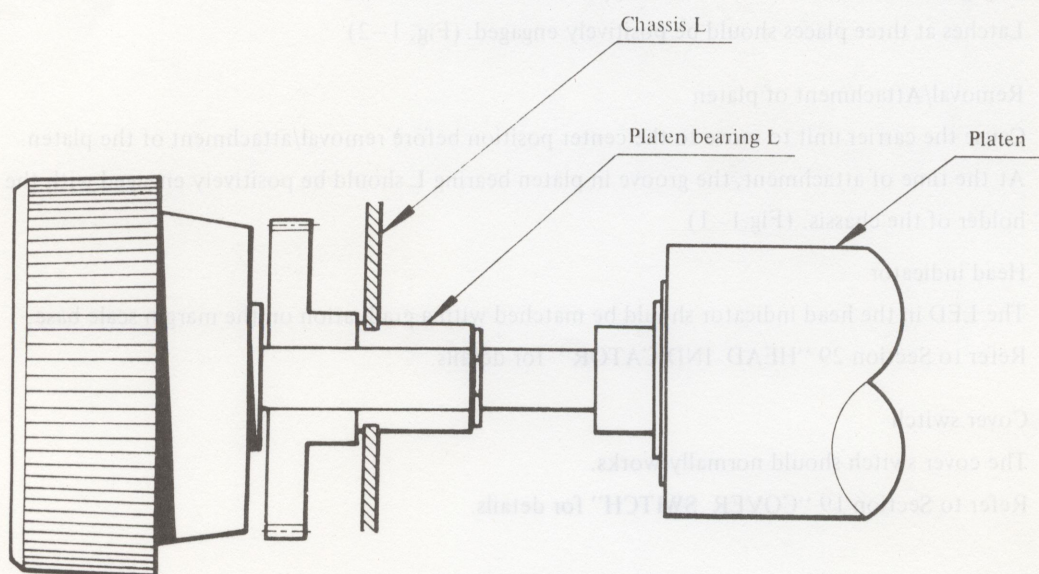


Fig. 1-1



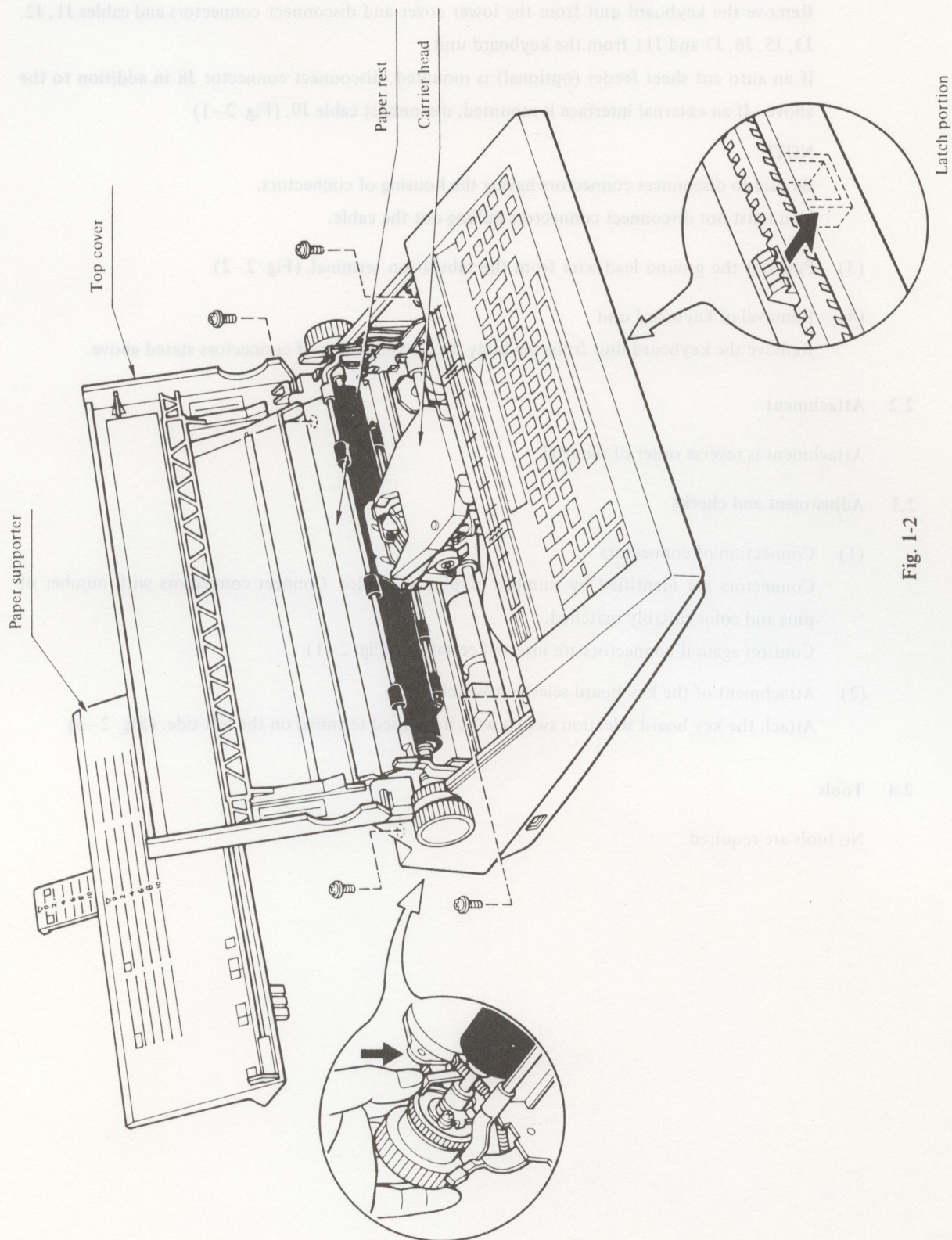


Fig. 1-2



## 2. KEYBOARD UNIT

### 2.1 Removal

- (1) Removal of upper cover

Refer to Section 1 "UPPER COVER".

- (2) Disconnection of connectors

Remove the keyboard unit from the lower cover and disconnect connectors and cables J1, J2, J3, J5, J6, J7 and J11 from the keyboard unit.

If an auto cut sheet feeder (optional) is mounted, disconnect connector J8 in addition to the above. If an external interface is mounted, disconnect cable J9. (Fig. 2-1)

#### NOTE:

Be sure to disconnect connectors having the housing of connectors.

You must not disconnect connectors pulling out the cable.

- (3) Pull out the ground lead wire from the tabulation terminal. (Fig. 2-2)

- (4) Removal of keyboard unit

Remove the keyboard unit from the body by disconnection of connectors stated above.

### 2.2 Attachment

Attachment is reverse order of removal.

### 2.3 Adjustment and checks

- (1) Connection of connectors

Connectors are identified by number of pins and color. Connect connectors with number of pins and color suitably matched.

Confirm again if connectors are inserted certainly. (Fig. 2-1)

- (2) Attachment of the key board selection switch

Attach the key board selection switch with its unused terminal on the left side. (Fig. 2-3)

### 2.4 Tools

No tools are required.



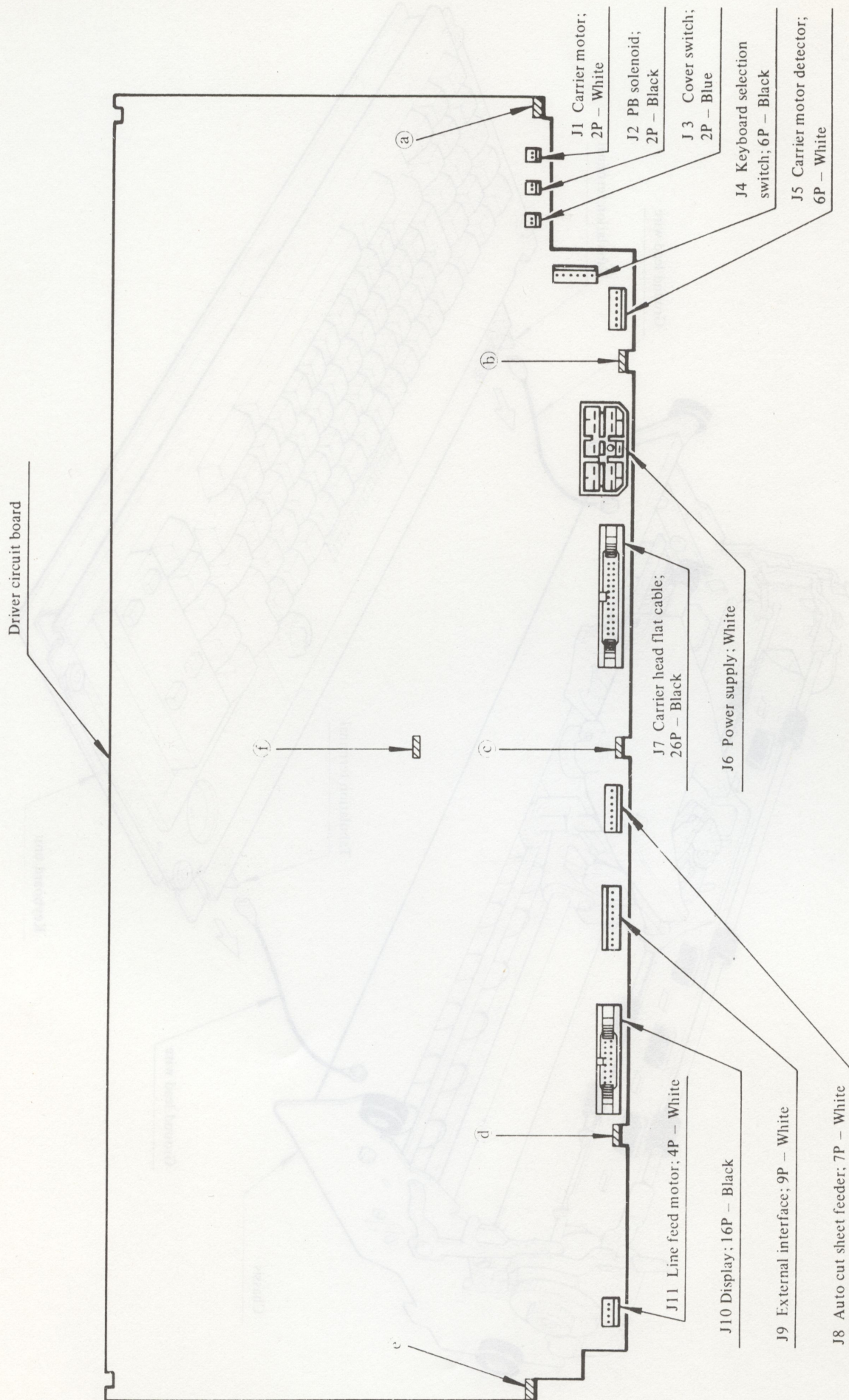


Fig. 2-1



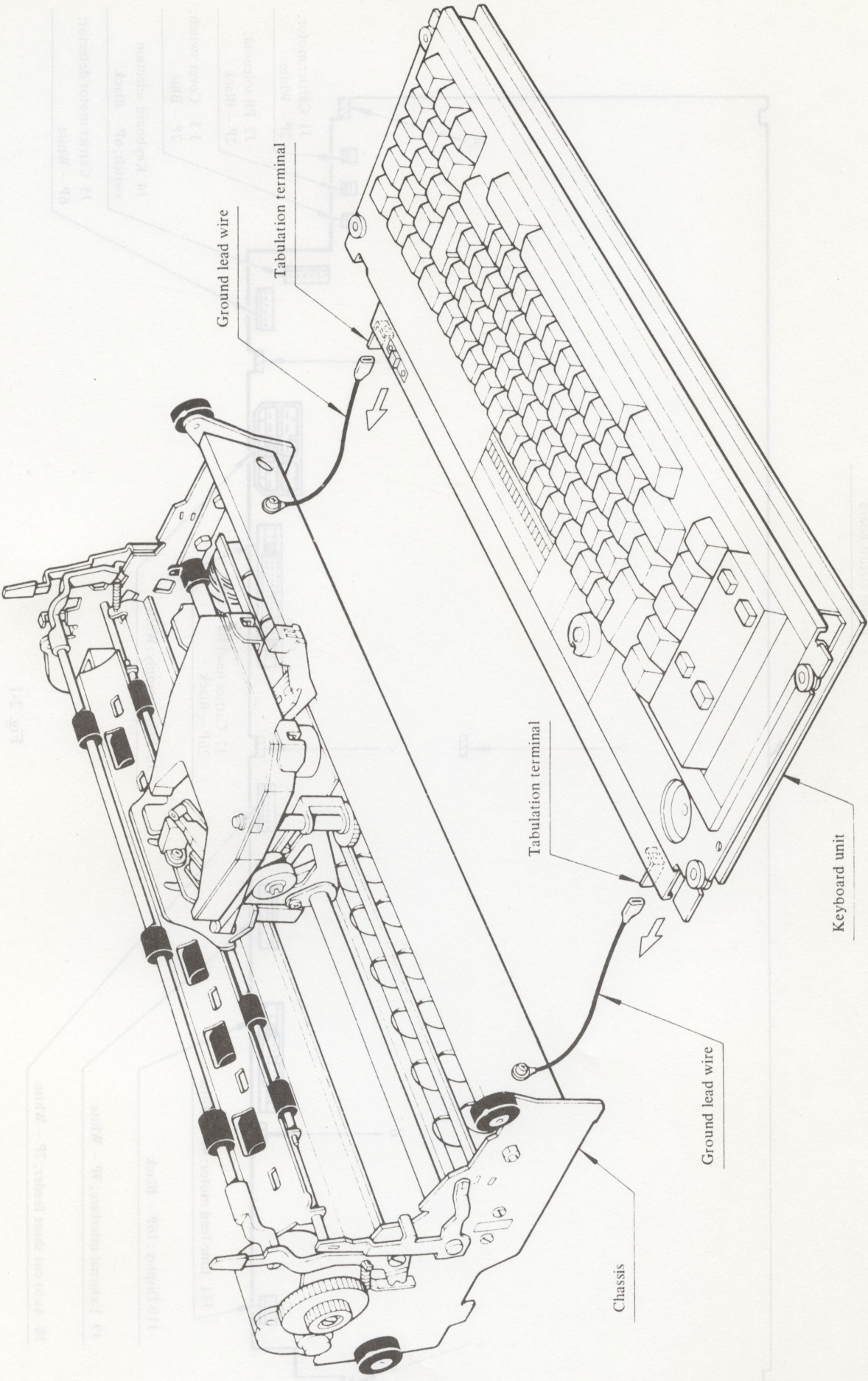


Fig. 2-2



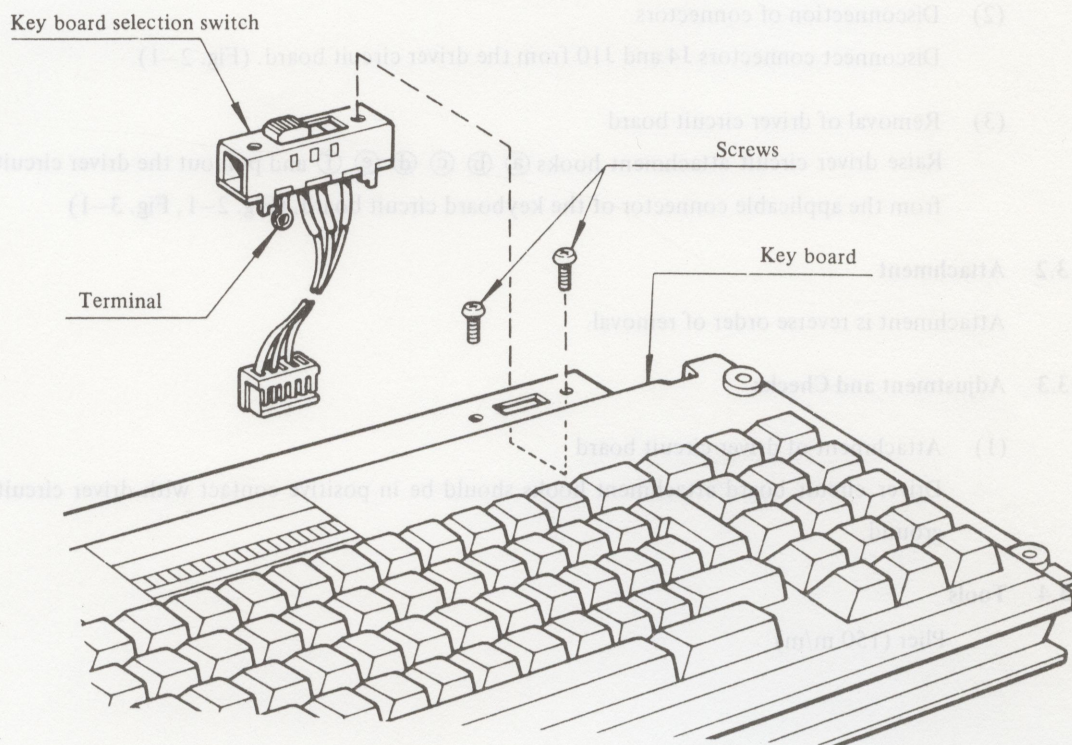


Fig. 2-3



### 3. DRIVER CIRCUIT BOARD

#### 3.1 Removal

- (1) Removal of keyboard unit

Refer to Section 2 "KEYBOARD UNIT".

- (2) Disconnection of connectors

Disconnect connectors J4 and J10 from the driver circuit board. (Fig. 2-1)

- (3) Removal of driver circuit board

Raise driver circuit attachment hooks (a) (b) (c) (d) (e) (f) and pull out the driver circuit board from the applicable connector of the keyboard circuit board. (Fig. 2-1, Fig. 3-1)

#### 3.2 Attachment

Attachment is reverse order of removal.

#### 3.3 Adjustment and Checks

- (1) Attachment of driver circuit board

Driver circuit board attachment hooks should be in positive contact with driver circuit board ground.

#### 3.4 Tools

Plier (150 m/m)

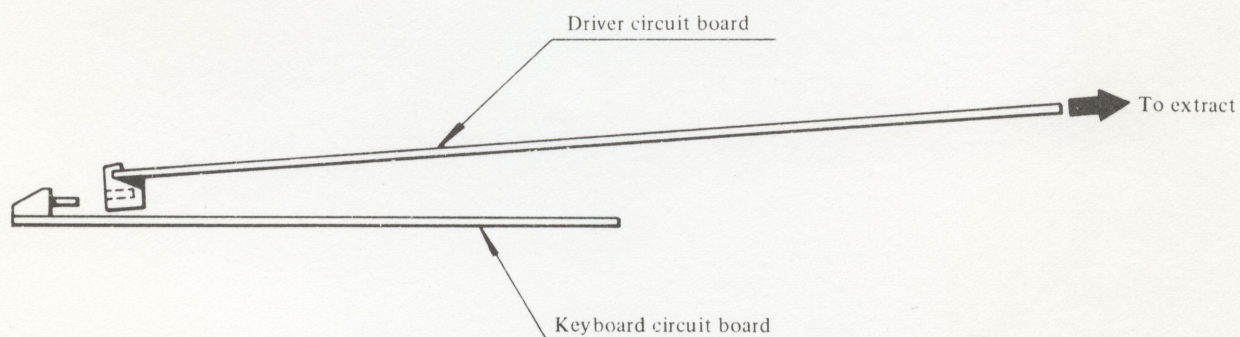


Fig. 3-1



## 4. DISPLAY CIRCUIT BOARD

### 4.1 Removal

- (1) Removal of keyboard unit  
Refer to Section 2 "KEYBOARD UNIT".
- (2) Removal of driver circuit board  
Refer to Section 3 "DRIVER CIRCUIT BOARD".
- (3) Removal of display circuit board  
Raise display circuit board attachment hooks ⑧ ⑨ ⑩ and remove the circuit board.  
(Fig. 4-1)

### 4.2 Attachment

Attachment is reverse order of removal.

### 4.3 Adjustment and Checks

None

### 4.4 Tools

Plier (150 mm)

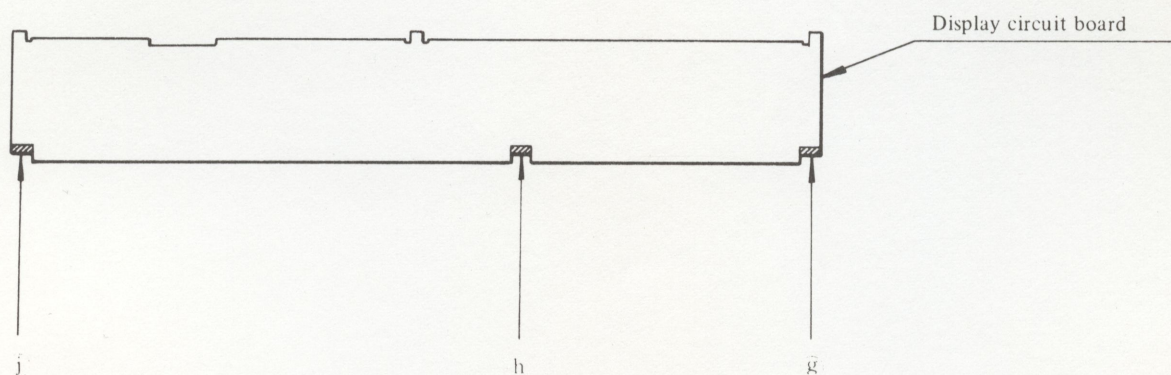


Fig. 4-1



## 5. KEYBOARD

### 5.1 Removal

- (1) Removal of keyboard unit

Refer to Section 2 "KEYBOARD UNIT".

- (2) Removal of driver circuit board

Refer to Section 3 "DRIVER CIRCUIT BOARD".

- (3) Removal of display circuit board

Refer to Section 4 "DISPLAY CIRCUIT BOARD".

\* The keyboard unit is composed of keyboard, driver circuit board and display circuit board. Accordingly, the individual keyboard is left as a result of removal of the driver circuit board and the display circuit board. The following description is therefore omitted.





## 6. POWER SUPPLY CIRCUIT BOARD

### 6.1 Removal

- (1) Removal of upper cover

Refer to Section 1 "UPPER COVER".

- (2) Removal of keyboard unit

Refer to Section 2 "KEYBOARD UNIT".

- (3) Removal of chassis unit

Refer to Section 11 "CHASSIS UNIT".

- (4) Disconnection of connector

Disconnect the connector that comes from the power supply transformer. (Fig. 6-10)

- (5) Removal of power supply circuit board

Remove the power supply circuit board screw (1 pc) and then remove the power supply circuit board from the lower cover.

### 6.2 Attachment

Attachment is reverse order of removal.

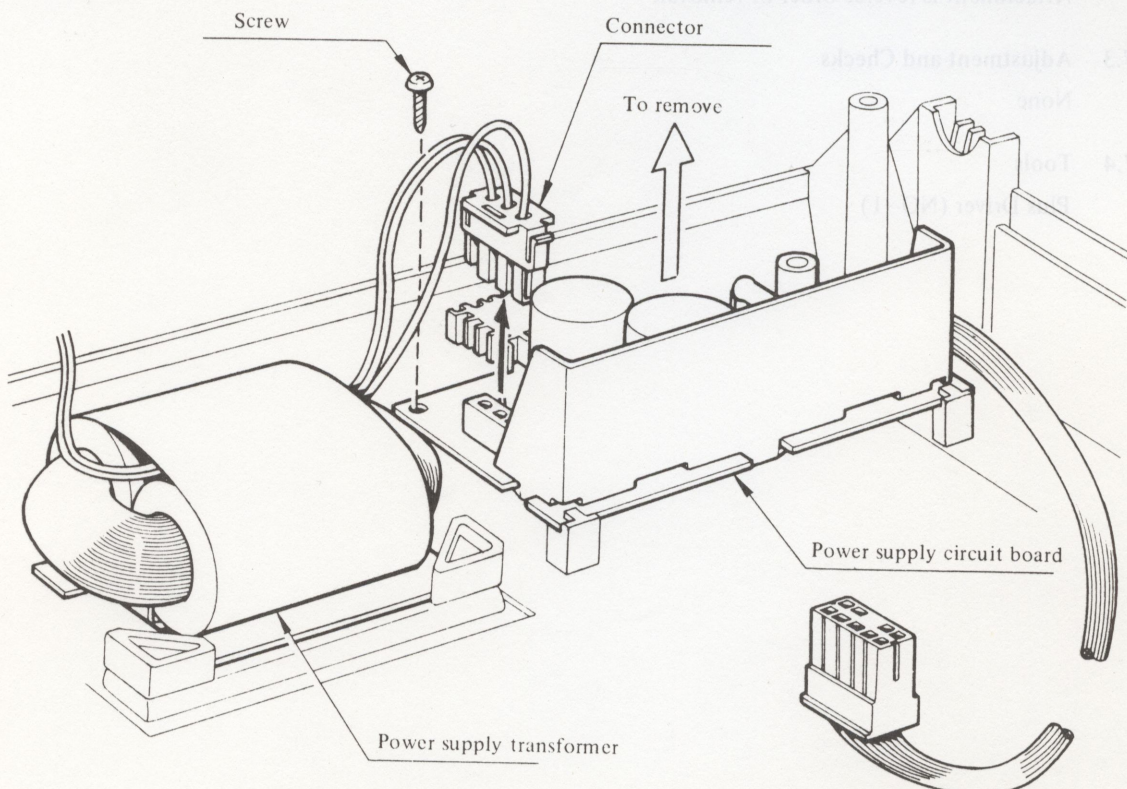
### 6.3 Adjustment and Checks

None

### 6.4 Tools

Plus Driver (NO-1)

Fig. 6-1





## 7. POWER SUPPLY TRANSFORMER

### 7.1 Removal

- (1) Removal of upper cover  
Refer to Section 1 "UPPER COVER".
- (2) Removal of keyboard unit  
Refer to Section 2 "KEYBOARD UNIT".
- (3) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (4) Removal of filter circuit board cover  
Remove latches (1 place each on R side and L side) of the filter circuit board cover from the lower cover, and then remove the filter circuit board cover. (Fig. 7-1)
- (5) Disconnection of connectors  
Disconnect connectors which come from the power supply circuit board and filter circuit board. (Fig. 7-1)
- (6) Disconnection of ground lead wire  
Disconnect the ground lead wire from the power supply transformer with its screw removed. (Fig. 7-1)
- (7) Removal of transformer  
Remove transformer screws (2 pcs) and then remove the transformer from the lower cover. (Fig. 7-1)

### 7.2 Attachment

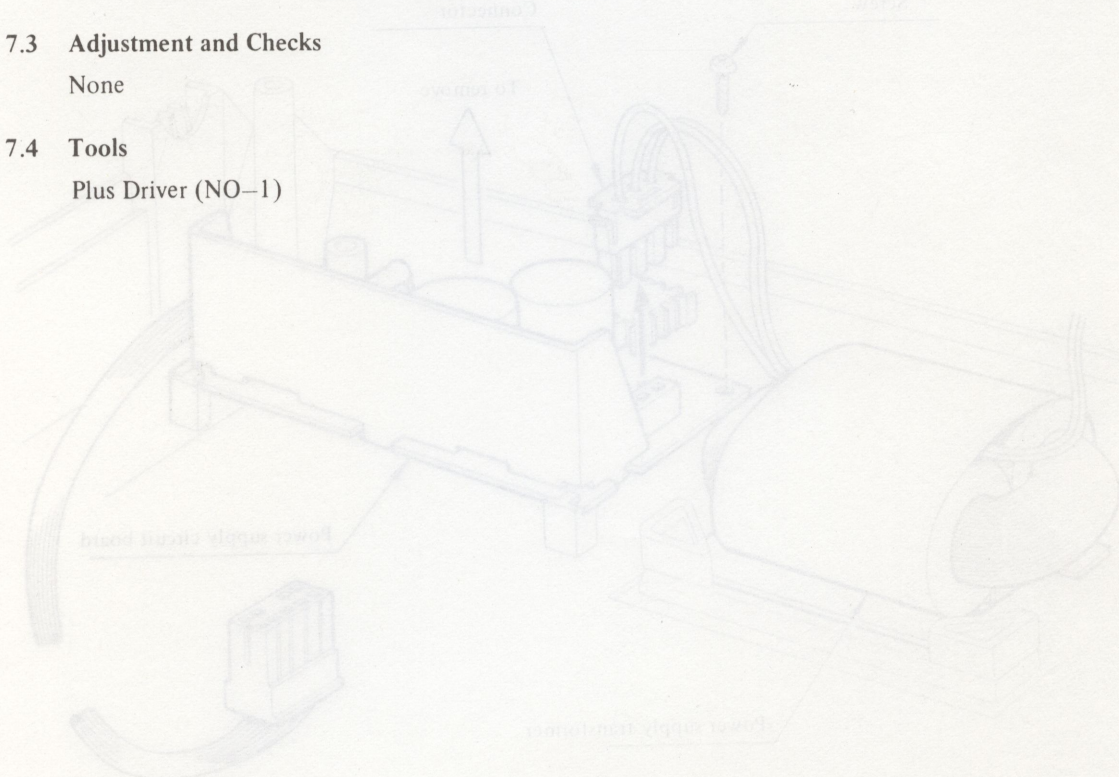
Attachment is reverse order of removal.

### 7.3 Adjustment and Checks

None

### 7.4 Tools

Plus Driver (NO-1)





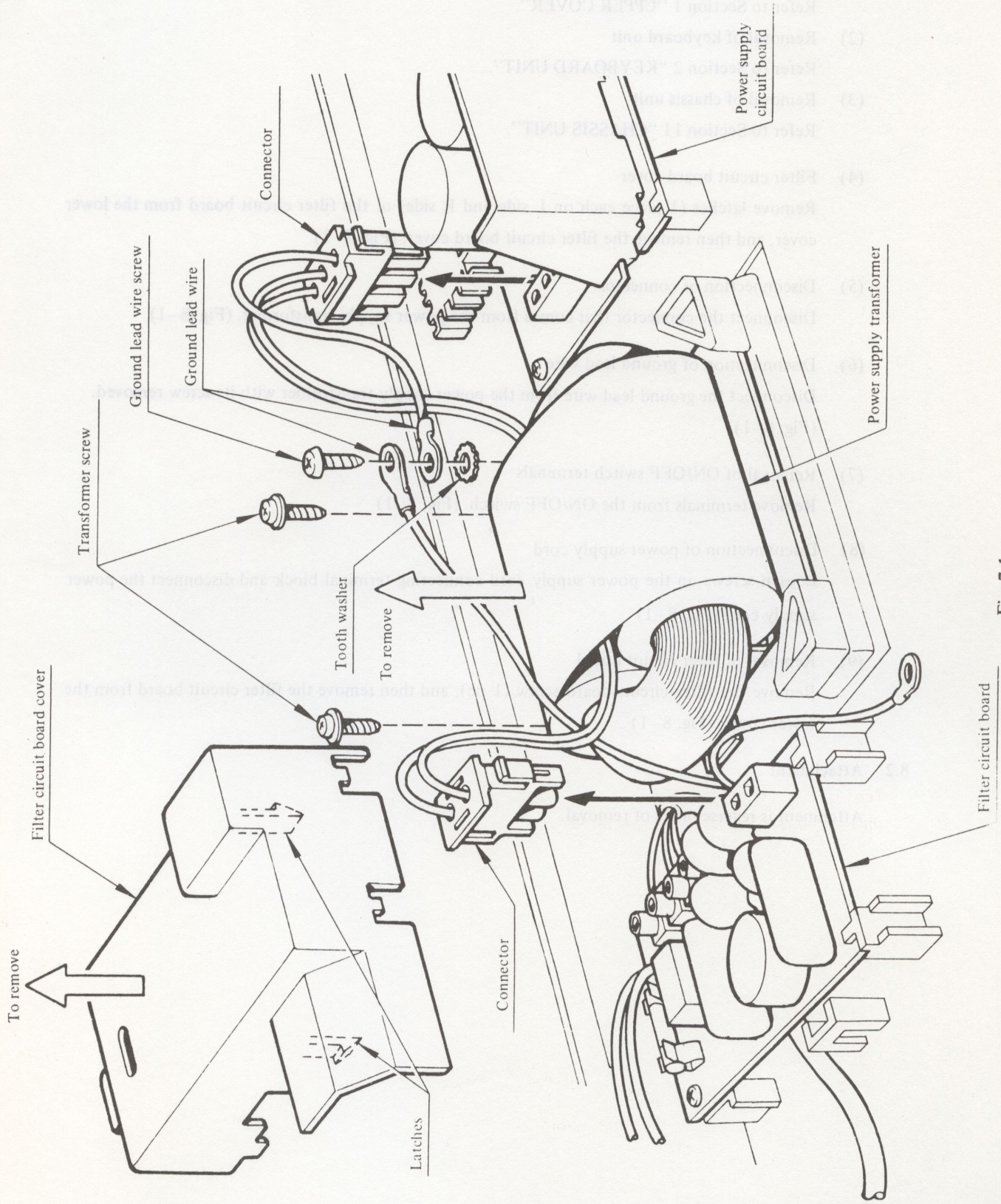


Fig. 7-1



## 8. FILTER CIRCUIT BOARD

### 8.1 Removal

- (1) Removal of upper cover  
Refer to Section 1 "UPPER COVER".
- (2) Removal of keyboard unit  
Refer to Section 2 "KEYBOARD UNIT".
- (3) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (4) Filter circuit board cover  
Remove latches (1 place each on L side and R side) of the filter circuit board from the lower cover, and then remove the filter circuit board cover. (Fig. 7-1)
- (5) Disconnection of connector  
Disconnect the connector that comes from the power supply transformer. (Fig. 8-1)
- (6) Disconnection of ground lead wire  
Disconnect the ground lead wire from the power supply transformer with its screw removed. (Fig. 8-1)
- (7) Removal of ON/OFF switch terminals  
Remove terminals from the ON/OFF switch. (Fig. 8-1)
- (8) Disconnection of power supply cord  
Loosen screws on the power supply cord connecting terminal block and disconnect the power supply cord (Fig. 8-1)
- (9) Removal of filter circuit board  
Remove the filter circuit board screw (1 pc), and then remove the filter circuit board from the lower cover. (Fig. 8-1)

### 8.2 Attachment

Attachment is reverse order of removal.



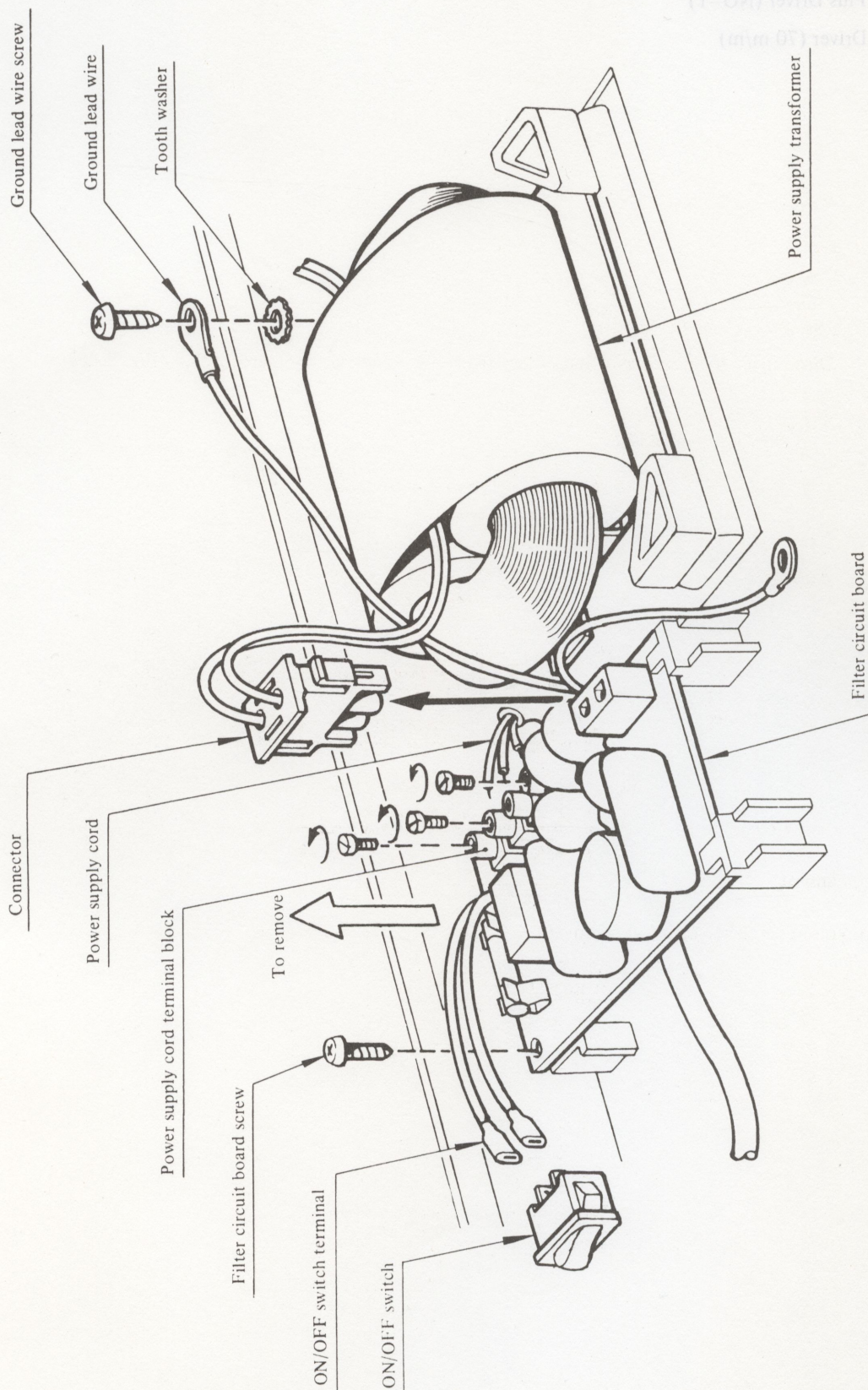


Fig. 8-1



### 8.3 Adjustment and Checks

None

## 8.4 Tools

### Plus Driver (NO-1)

Driver (70 m/m)



## 9. ON/OFF SWITCH

### 9.1 Removal

- (1) Removal of upper cover  
Refer to Section 1 "UPPER COVER".
- (2) Removal of keyboard unit  
Refer to Section 2 "KEYBOARD UNIT".
- (3) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (4) Removal of filter circuit board cover  
Remove latches (1 place each on L side and R side) of the filter circuit board cover from the lower cover, and then remove the filter circuit board cover. (Fig. 7-1)
- (5) Removal of ON/OFF switch terminal  
Remove ON/OFF switch terminals. (Fig. 8-1)
- (6) Removal of ON/OFF switch  
Remove the ON/OFF switch from the lower cover.

### 9.2 Attachment

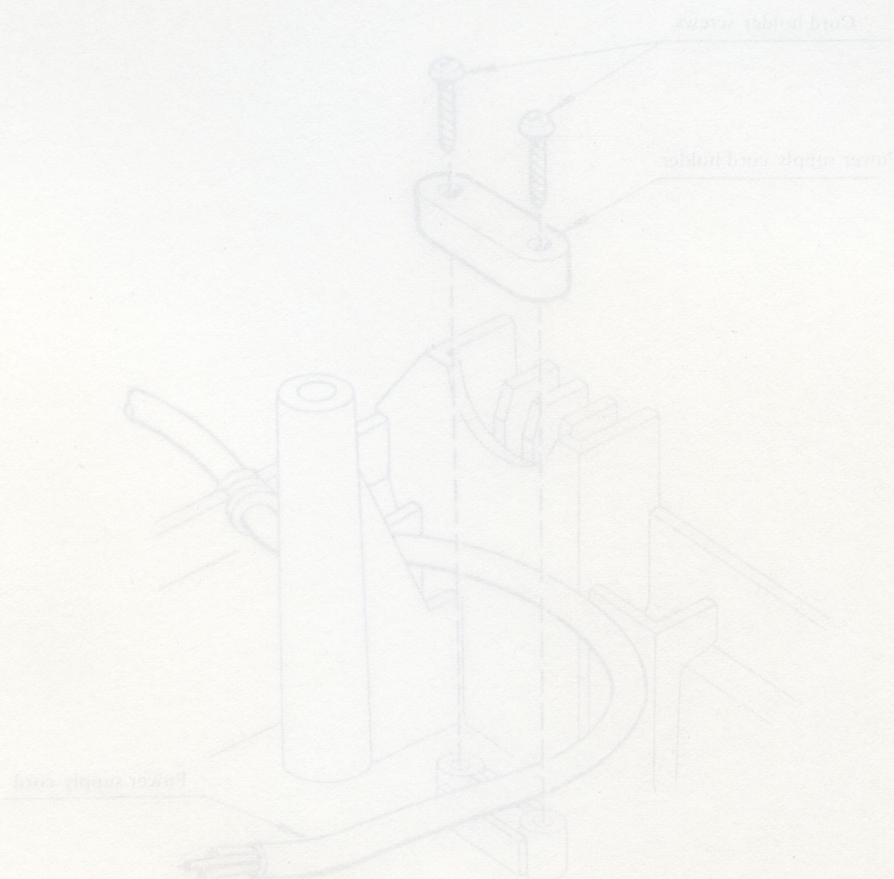
Attachment is reverse order of removal.

### 9.3 Adjustment and Checks

None

### 9.4 Tools

None





## 10. POWER SUPPLY CORD

### 10.1 Removal

- (1) Removal of upper cover  
Refer to Section 1 "UPPER COVER".
- (2) Removal of keyboard unit  
Refer to Section 2 "KEYBOARD UNIT".
- (3) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (4) Removal of filter circuit board  
Refer to Section 8 "FILTER CIRCUIT BOARD".
- (5) Disconnection of power supply cord  
Remove power supply cord holder screws (2 pcs) and then disconnect the power supply cord from the lower cover. (Fig. 10-1)

### 10.2 Attachment

Attachment is reverse order of removal.

### 10.3 Adjustment and Checks

- (1) Cord bush  
The cord bush should be positively fitted to the lower cover. (Fig. 10-2)

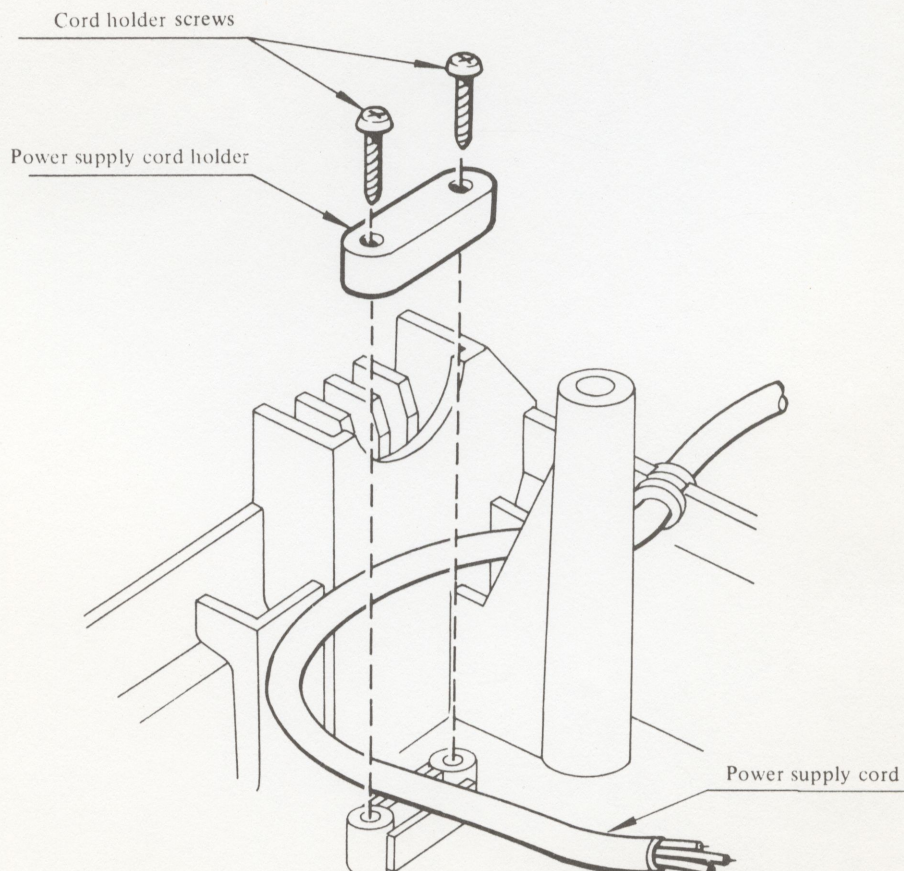


Fig. 10-1



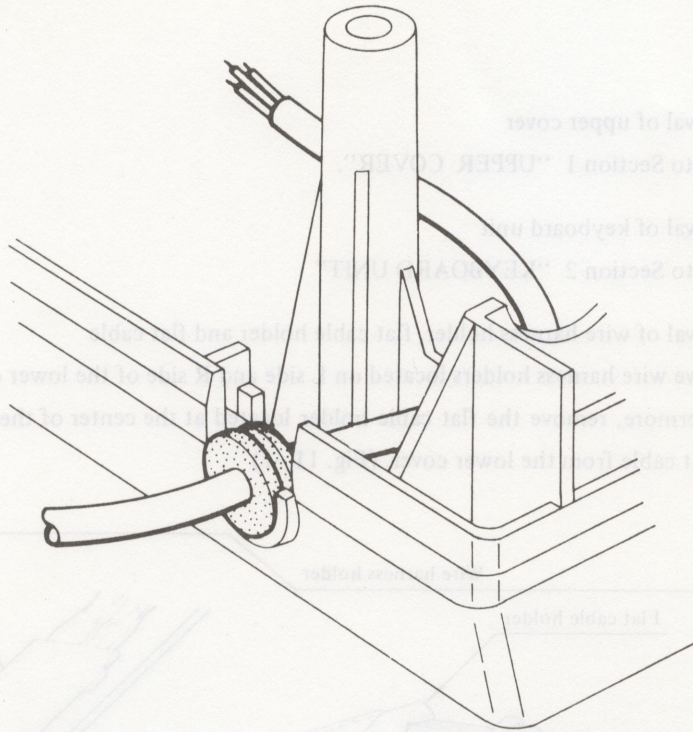


Fig. 10-2

#### 10.4 Tools

Plus Driver (NO-1)

Driver (70 m/m)



## 11. CHASSIS UNIT

### 11.1 Removal

- (1) Removal of upper cover  
Refer to Section 1 "UPPER COVER".
- (2) Removal of keyboard unit  
Refer to Section 2 "KEYBOARD UNIT"
- (3) Removal of wire harness holder, flat cable holder and flat cable  
Remove wire harness holders located on L side and R side of the lower cover.  
Furthermore, remove the flat cable holder located at the center of the lower cover and remove the flat cable from the lower cover. (Fig. 11-1)

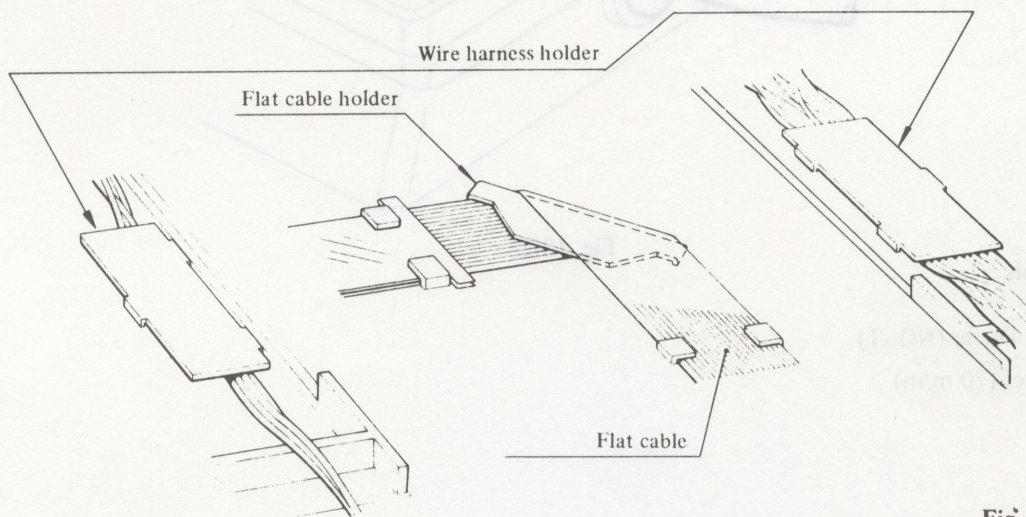


Fig. 11-1

- (4) Disconnection of chassis ground lead wire  
Disconnect the ground lead wire from the chassis with its screw removed.

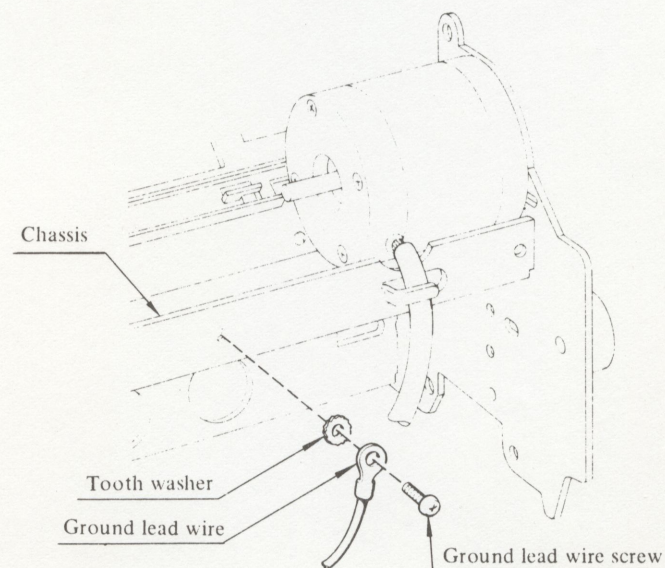


Fig. 11-2



(5) Removal of chassis unit

Remove the chassis unit from the lower cover.

It is recommended that the chassis unit is held as shown in Fig. 11-3.

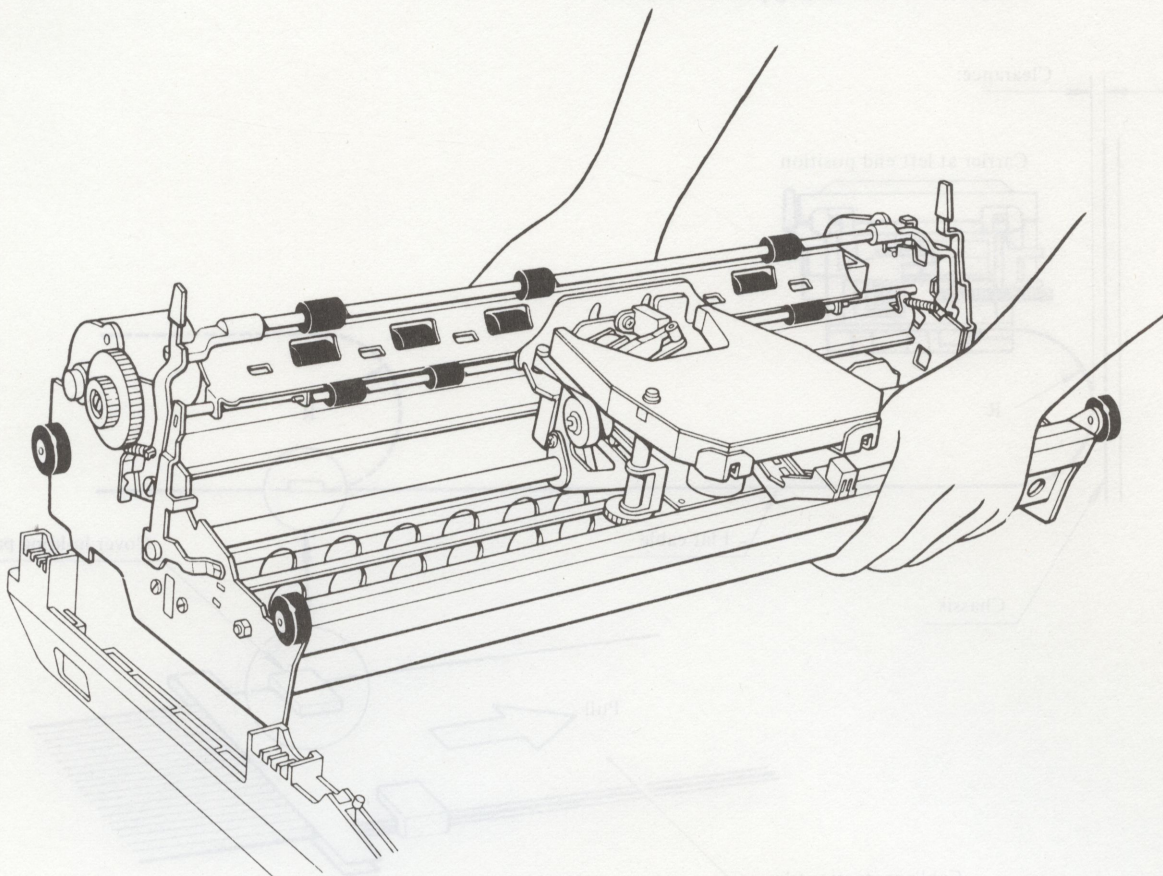


Fig. 11-3

11.2 Attachment

Attachment is reverse order of removal.

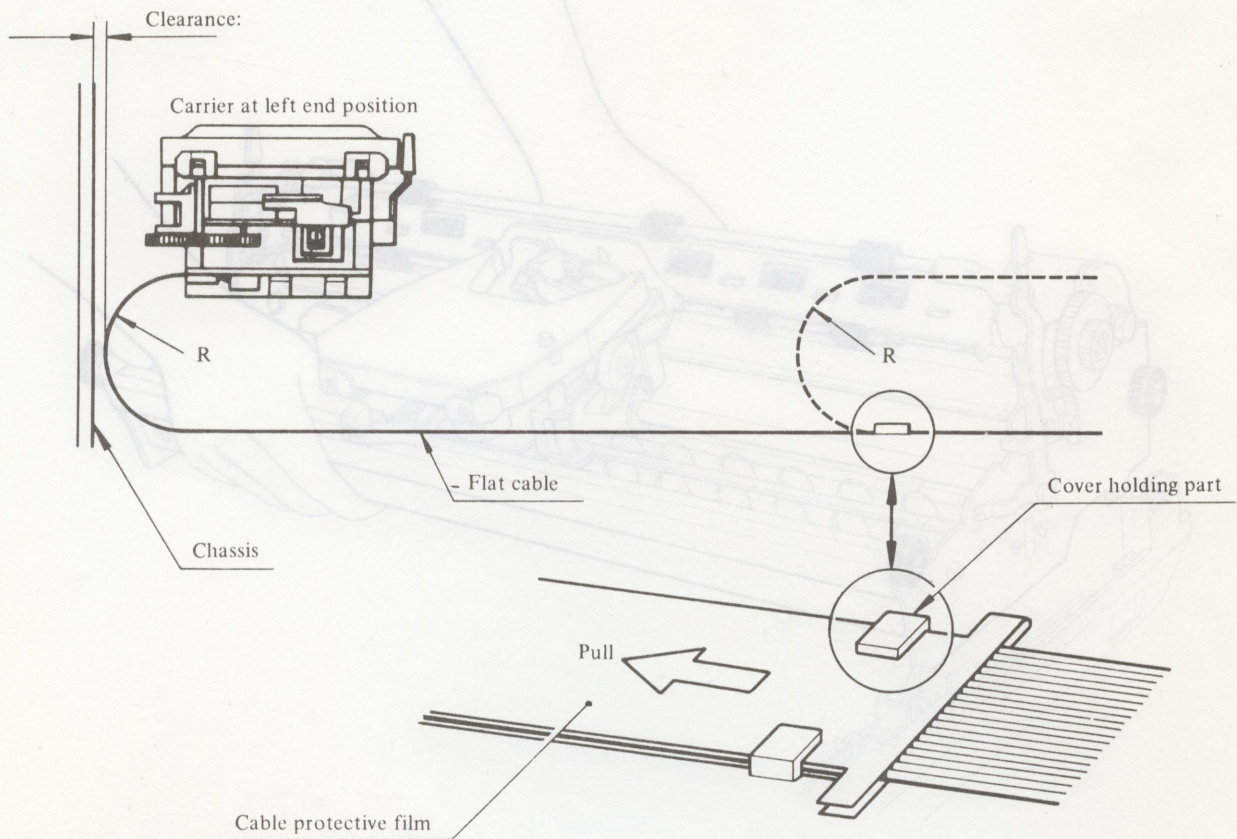


### 11.3 Adjustment and Checks

(1) Flat cable attaching position

Attach the flat cable in such a position that the flat cable has a large radius with a clearance to the chassis when the carrier is moved to the left end position.

Attach the flat cable in the position where the catching part of the cable protective film contacts the cover holding part at this time.



### 11.4 Tools

Plus Driver (NO-1)



## 12. CARRIER MOTOR

### 12.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of carrier motor  
Disconnect carrier motor lead wires from the cord keep, remove carrier motor screws (4 pcs) and then remove the carrier motor from the chassis. (Fig. 12-1)

### 12.2 Attachment

- (1) Attachment of carrier motor  
Mesh the carrier motor gear with the gear of the drive pulley, fit the embossment on the carrier motor in the guide hole in the chassis, and then fix the carrier motor by tightening carrier motor screws (4 pcs).  
(Fig. 12-1)

### 12.3 Adjustment and Checks

- (1) Backlash of carrier motor gear and drive pulley (gear)  
Loosen the drive pulley shaft nut and make adjustment by turning the drive pulley shaft so that the backlash of gears is zero and rotation is smooth. (Fig. 12-1)
- (2) Home position of carrier head  
Loosen the rope holder plate screw and move the carrier head to the left end position. Fully move the drive wire in the direction in which the drive pulley rotates counterclockwise. (Fig. 12-2)  
Then, connect the connector of the carrier motor detector to a checker, rotate the drive pulley clockwise to the vicinity of 210° position and stop it at a carrier home position (checker's LED lights up) closest to the 210° position. (Fig. 12-3)  
Fix the drive wire by the rope holder plate to the carrier body so that the clearance between stopper rubber L and carrier bearing is 0.8 ~ 1.2 mm, at the home position of the carrier motor. (Fig. 12-4)



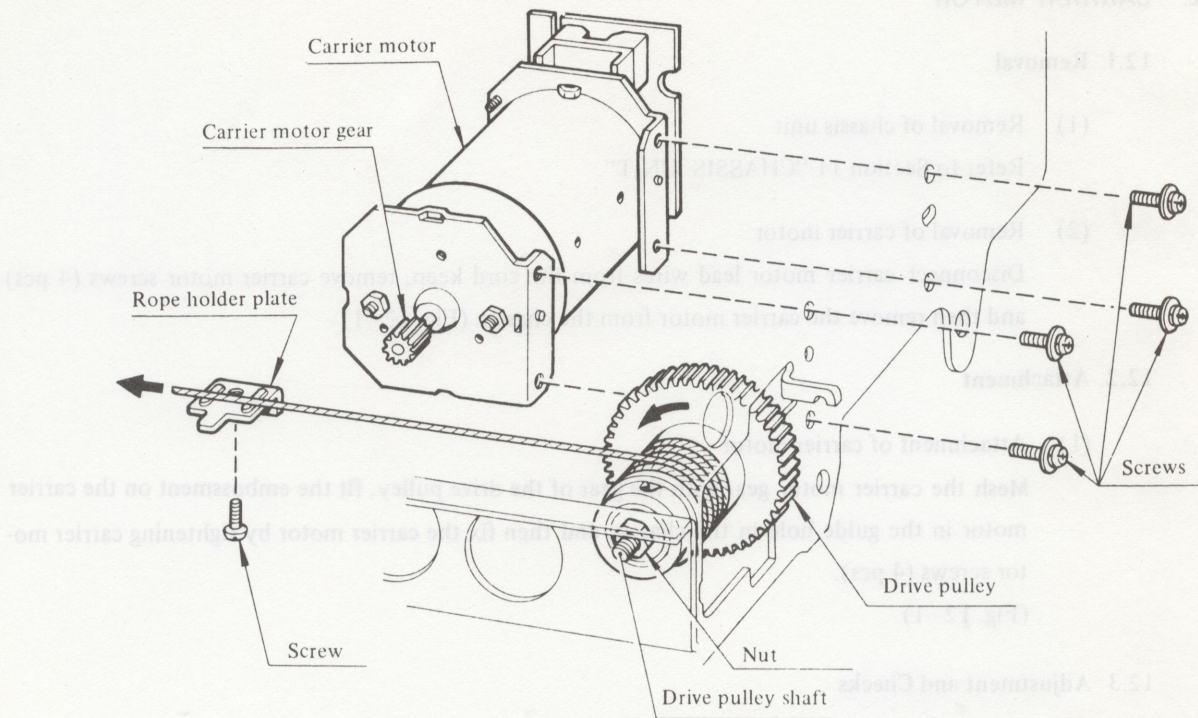


Fig. 12-1

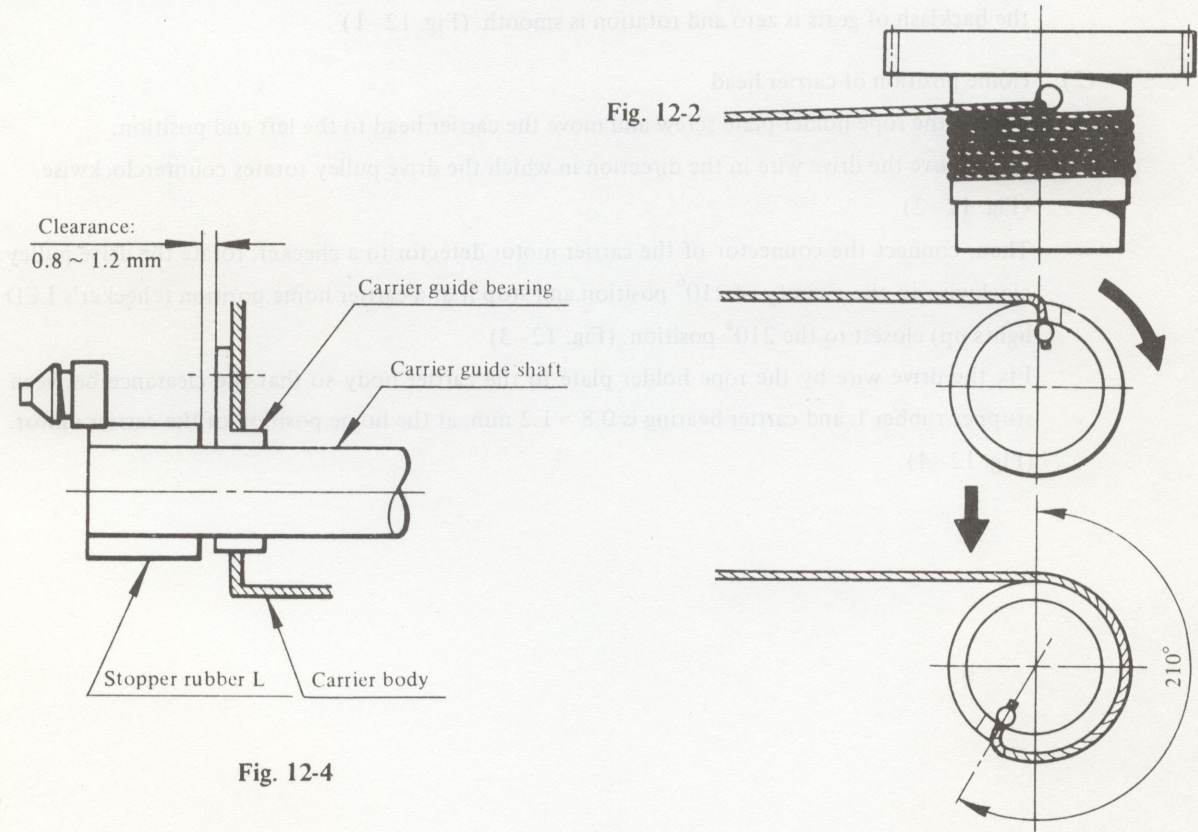


Fig. 12-4

Fig. 12-3

12.4 Tools

- Plus Driver (NO-1)
- Driver (6.2 x 200 m/m)
- Driver (4.7 x 200 m/m)
- Spanner (5.5 x 7 m/m)
- Checker



### 13. DRIVE WIRE AND PULLEY

#### 13.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT"
- (2) Removal of carrier unit  
Refer to Section 20 "CARRIER UNIT"
- (3) Removal of carrier motor  
Refer to Section 12 "CARRIER MOTOR"
- (4) Removal of tension pulley  
Remove the tension pulley shaft screw and then remove the tension pulley from the chassis.  
(Fig. 13-1)
- (5) Disconnection of drive wire  
Disconnect the drive wire from the drive pulley.  
(Fig. 13-1)
- (6) Removal of drive pulley  
Remove the drive pulley shaft nut and remove the drive pulley by extracting the drive pulley shaft from the chassis.  
(Fig. 13-1)

#### 13.2 Attachment

- (1) Attachment of drive pulley  
Mesh the drive pulley with the carrier motor gear. Put the drive motor shaft through chassis → drive pulley → chassis. Fit a washer on the drive pulley shaft and tighten the nut temporarily.  
(Fig. 13-1)
- (2) Connection of drive wire  
Hook drive wire's fitting to hole (A) on this side of the drive pulley. Wind the drive wire by six windings on the pulley groove by turning the drive pulley counterclockwise, and hook the fitting at the opposite end of the drive wire to another hole (B).  
(Fig. 13-2)
- (3) Attachment of tension pulley  
Fit the tension pulley while stringing the drive wire. Put the tension pulley shaft through oval holes in the chassis and temporarily tighten screws to the tension pulley shaft to fix it in place.  
(Fig. 13-1)
- (4) Attachment is reverse order of removal.



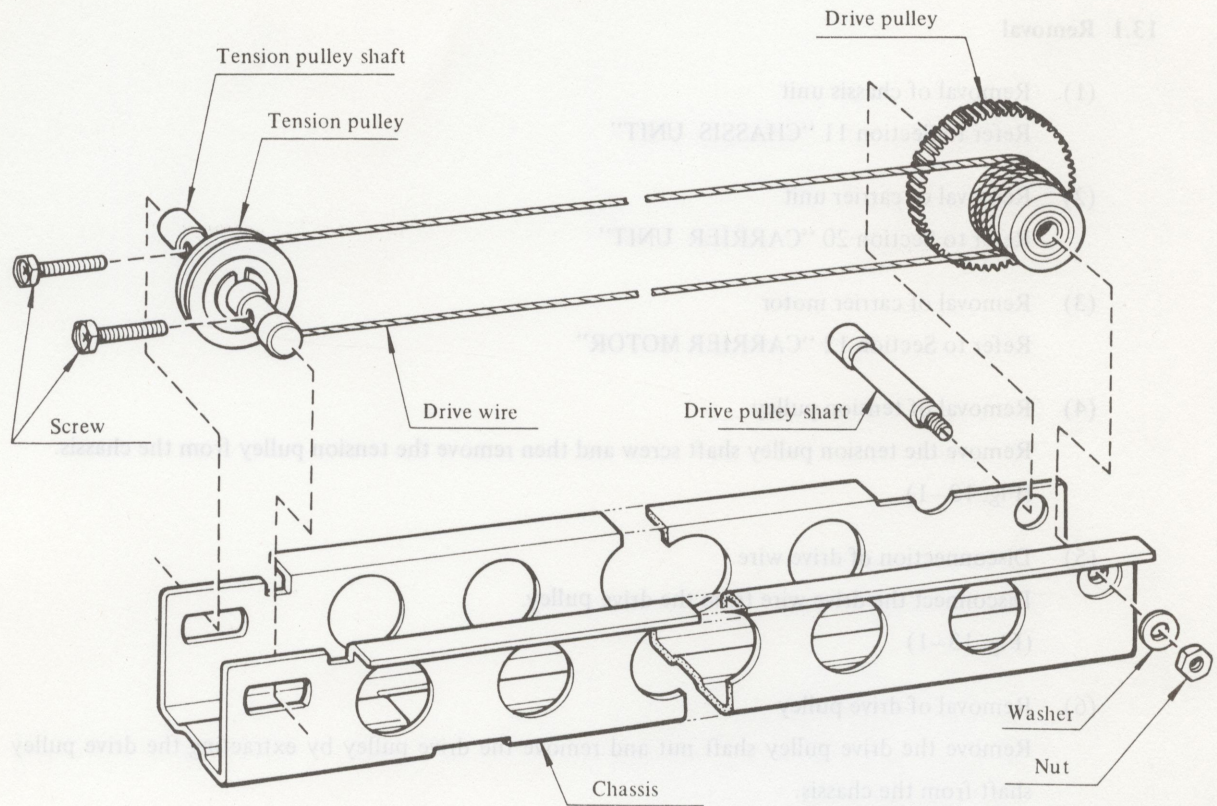


Fig. 13-1

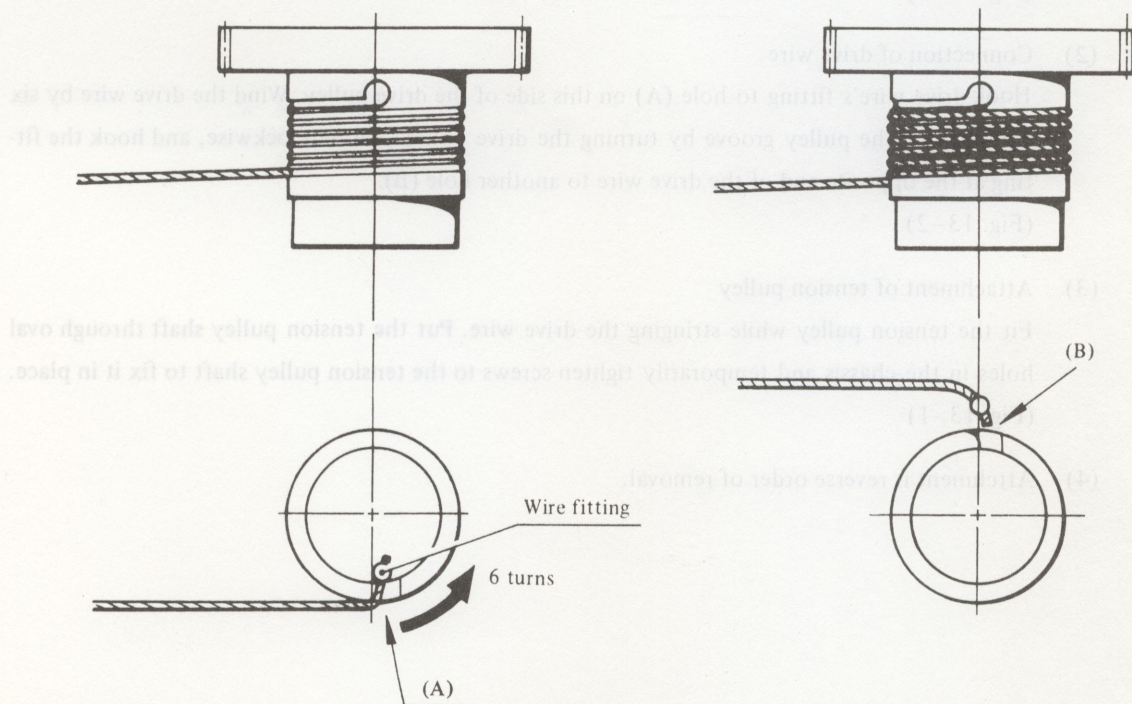


Fig. 13-2



### 13.3 Adjustment and Checks

#### (1) Drive wire tension

- (a) Move the drive wire rightward and leftward to extreme positions at which the drive pulley becomes unrotatable so that the drive wire fits to the drive pulley. (2 ~ 3 round trips)
- (b) Place the drive wire at the center position of the drive pulley as shown below, and make adjustment by turning the adjustment screw so that the deflection of the drive wire is 4.2 ~ 5.0 mm when a load of 300 g is attached to the center position of the wire between pulleys (center position between drive pulley and tension pulley).
- (c) When the adjustment screw is turned, the deflection value described in paragraph (b) should be obtained after surely making motions of paragraph (a) above.
- (d) Make this adjustment after completion of adjustment of the backlash between carrier motor gear and drive pulley (gear).

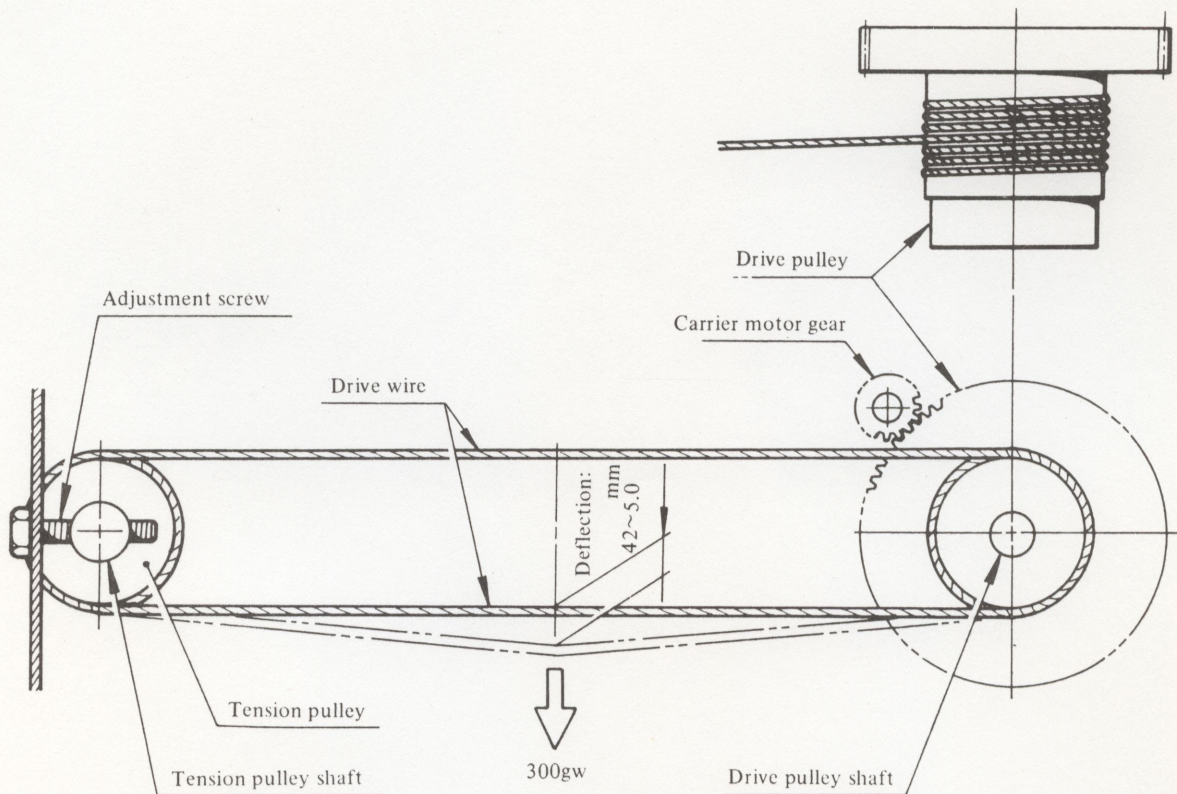


Fig. 13-3



- (2) Backlash between carrier motor gear and drive pulley (gear)

Refer to Section 12 "CARRIER MOTOR".

- (3) Home position of carrier head

Refer to Section 12 "CARRIER MOTOR".

#### 13.4 Tools

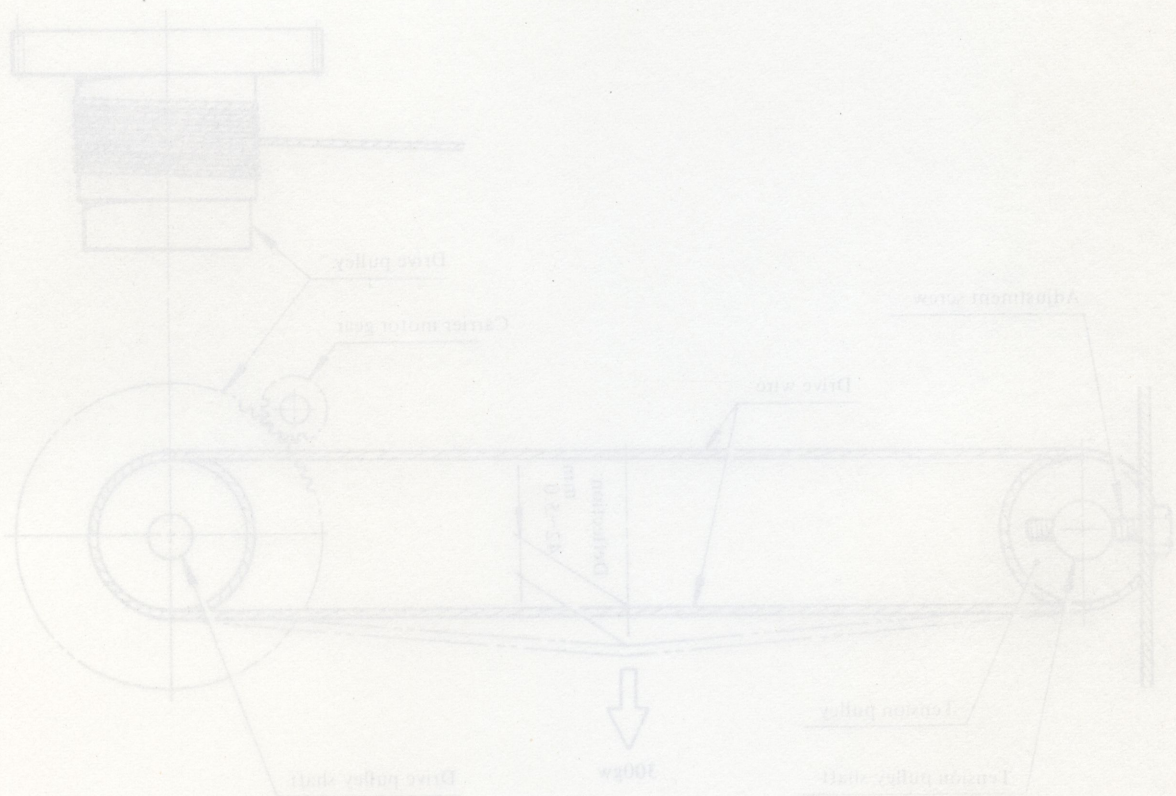
Plus Driver (NO-1)

Driver (6.2 x 200 m/m)

Driver (4.7 x 200 m/m)

Spanner (5.5 x 7 m/m)

Checker





## 14. LINE FEED MOTOR

### 14.1 Removal

- (1) Removal of chassis unit

Refer to Section 11 "CHASSIS UNIT"

- (2) Removal of line feed intermediate gear

Remove the intermediate gear screw and then remove the intermediate gear.

- (3) Removal of line feed motor

Remove line feed motor nuts and then remove the line feed motor from the chassis.

### 14.2 Attachment

Attachment is reverse order of removal.

### 14.3 Adjustment and Checks

- (1) Backlash of line feed intermediate gear

Attach the platen and make adjustment by the intermediate gear screw so that the backlash of the line feed intermediate gear is zero to both of the line feed motor gear and the platen gear and that rotation of the platen is smooth in paper release state.

### 14.4 Tools

Philips ( + ) screwdriver (large)

Box screwdriver (5.5 mm)

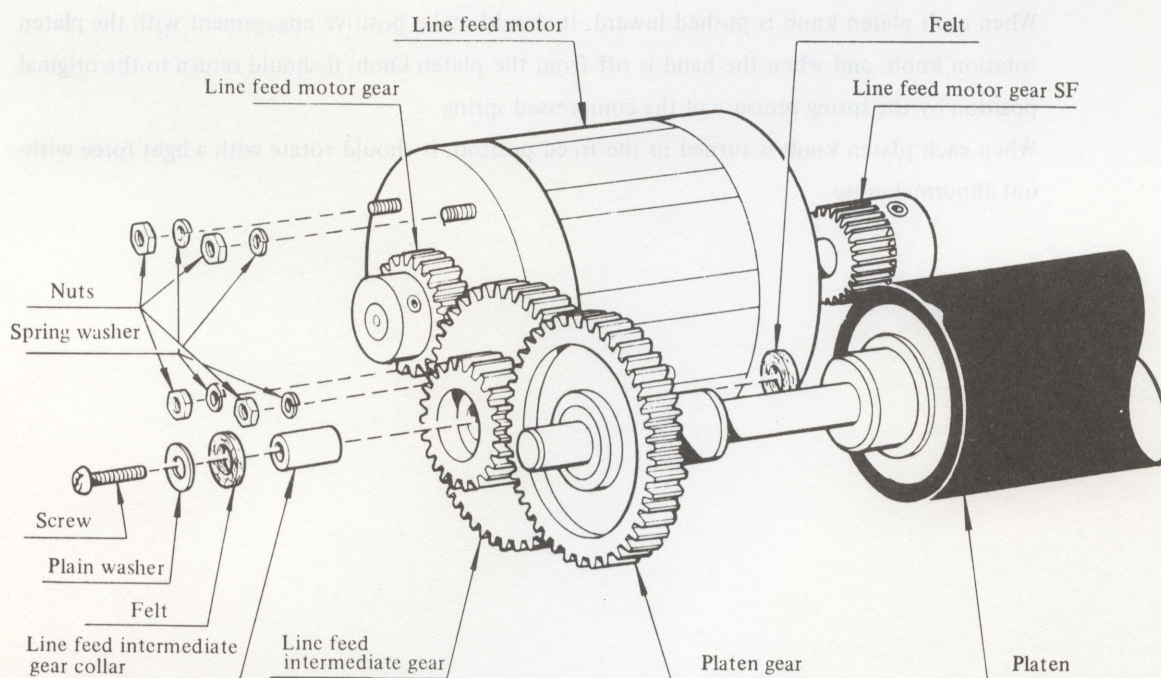


Fig. 14-1



## 15. PLATEN;

The platen is removable, and the method for its removal/attachment was described in Section 1 "UPPER COVER". Disassembly and assembly of its component parts are described in this section.

### 15.1 Disassembly

#### (1) Removal of platen knobs and platen rotation knobs

The platen knob and platen rotation knob can be extracted in a unit from the platen shaft when the spring pin that fixes the platen rotation knob is extracted. The work is the same on L side and R side.

The platen knob and platen rotation knob become separate when they are pulled to opposite directions after expanding catches on the platen rotation knob. A spring is fitted between them.

(Fig. 15-1, Fig. 15-2)

#### (2) Removal of platen gear

Loosen the set screw and extract the platen gear from the platen shaft.

#### (3) Removal of platen bearings

Platen bearing L can be extracted from the platen shaft as the platen gear was removed.

Platen bearing R can be extracted from the platen shaft when the E-ring is removed.

### 15.2 Assembly

Assembly is reverse order of disassembly.

### 15.3 Adjustment and Checks

#### (1) Operation of platen knobs

When each platen knob is pushed inward, it should make positive engagement with the platen rotation knob, and when the hand is off from the platen knob, it should return to the original position by the spring pressure of the compressed spring.

When each platen knob is turned in the freed position, it should rotate with a light force without abnormal noise.

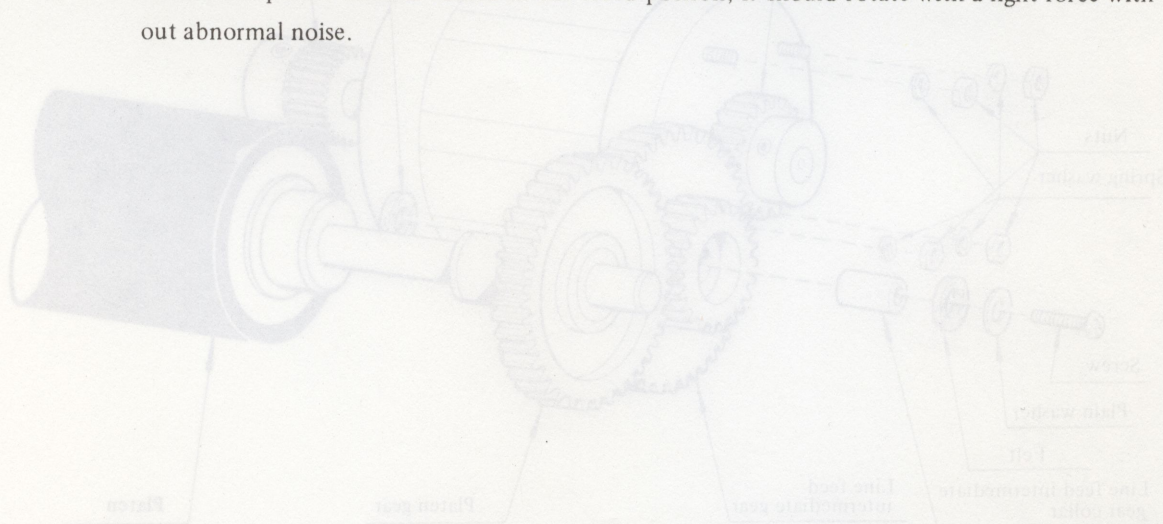


Fig. 14-1



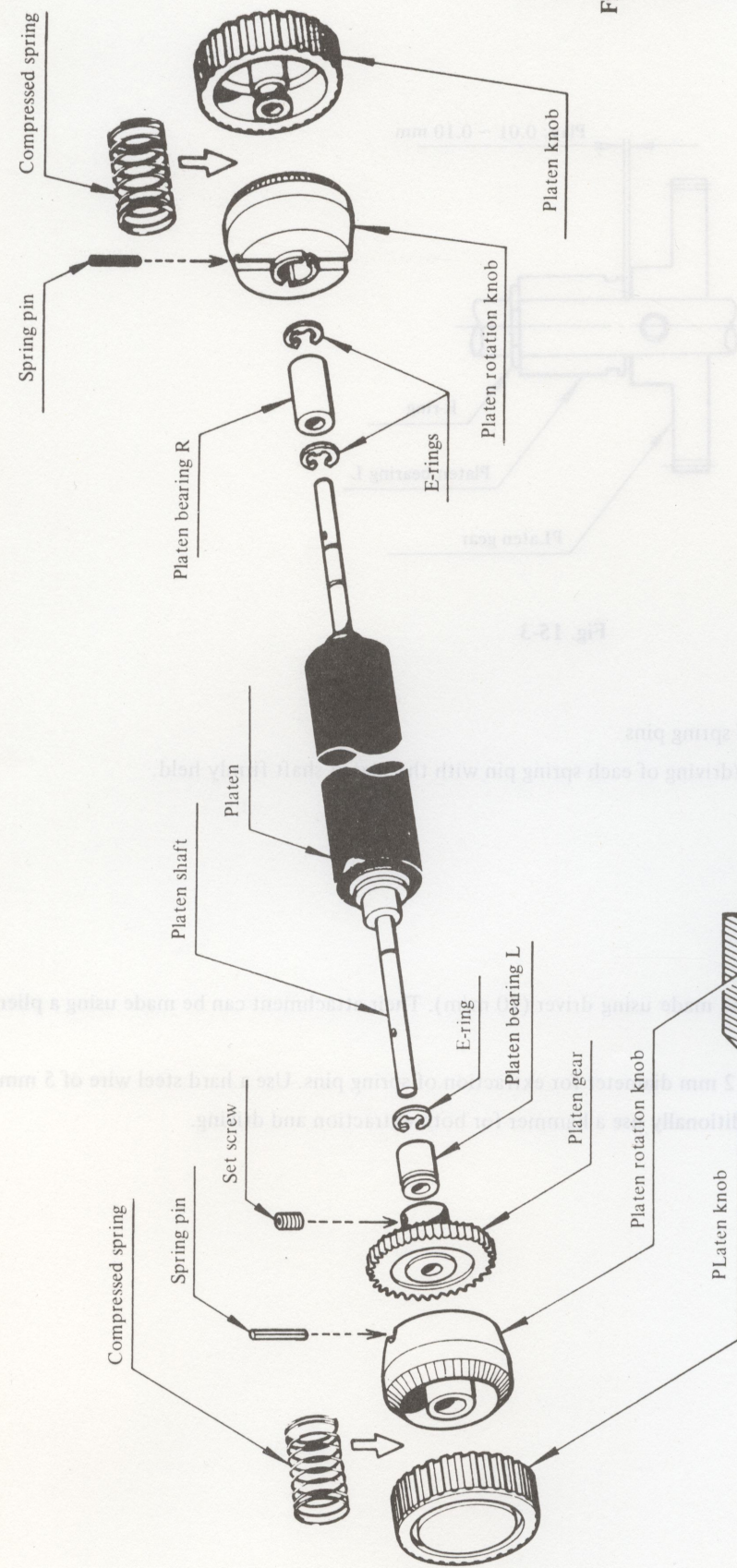


Fig. 15-1

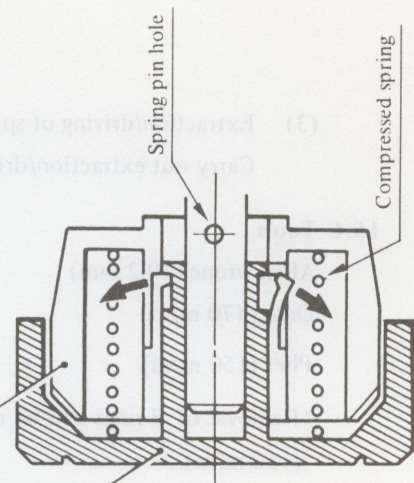


Fig. 15-2



## (2) Platen bearing L

Make adjustment by the platen gear set screw so that platen bearing L lightly rotates with a lateral play of 0.01 ~ 0.10 mm. (Fig. 15-3)

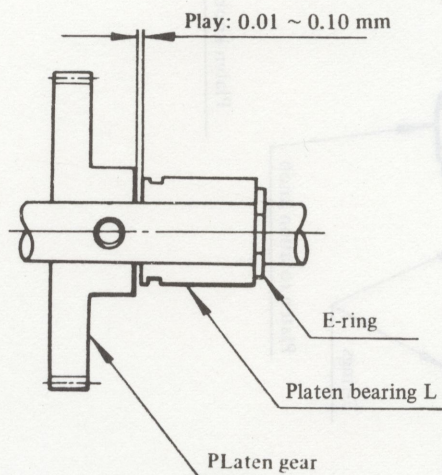


Fig. 15-3

## (3) Extraction/driving of spring pins

Carry out extraction/driving of each spring pin with the platen shaft firmly held.

**15.4 Tools**

Allen wrench (0.2 mm)

Driver (70 m/m)

Plier (150 m/m)

\* Removal of E-rings can be made using driver (70 m/m). Their attachment can be made using a plier (150 m/m).

\* Use a hard steel wire of 2 mm diameter for extraction of spring pins. Use a hard steel wire of 5 mm diameter for driving. Additionally use a hammer for both extraction and driving.



## 16. PAPER BAIL SOLENOID

### 16.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of paper bail operation shaft  
Remove the E-ring and then remove the paper bail operation shaft.
- (3) Removal of paper bail solenoid  
Remove solenoid screws (2 pcs), detach lead wires from the holder in the rear of the chassis and also from the cord keep in the front of the chassis, and then remove the paper bail solenoid.

### 16.2 Attachment

Attachment is reverse order of removal.

### 16.3 Adjustment and Checks

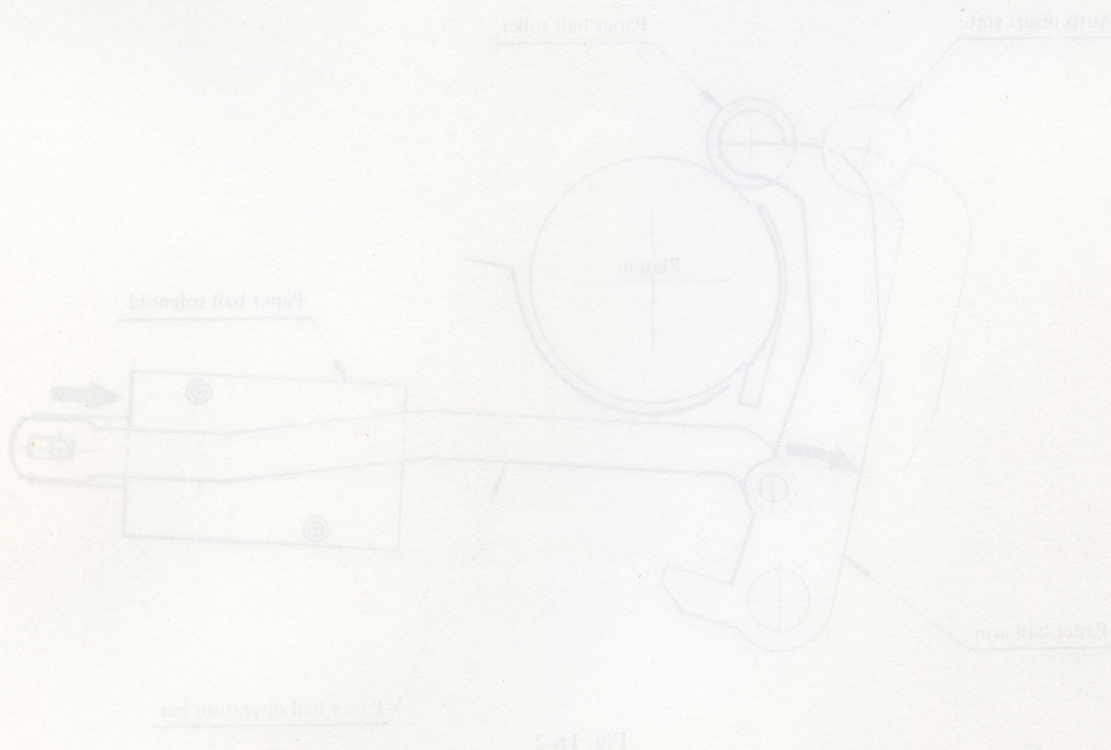
- (1) Automatic paper insertion  
Assure that paper of A3 size can be inserted by auto insert operation with its long side used as the leading edge.

### 16.4 Tools

Plus Driver (NO-1)

Driver (70 m/m)

Plier (150 m/m)





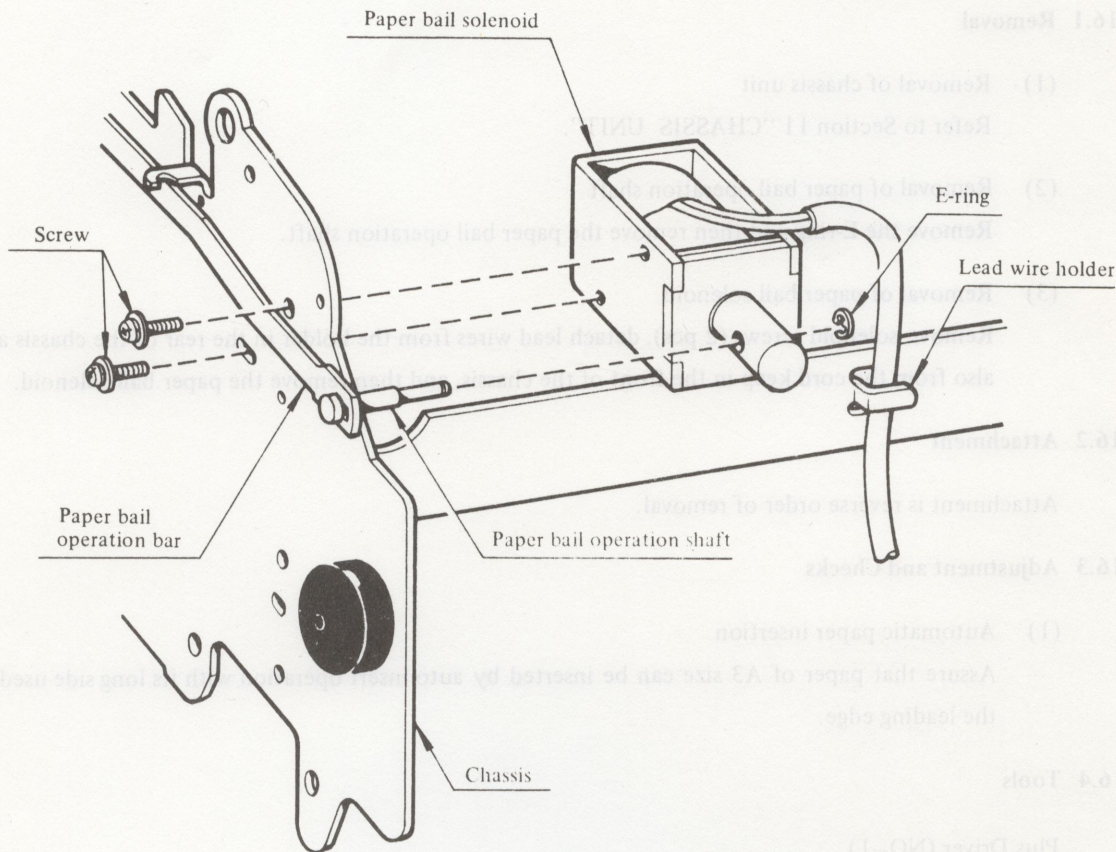


Fig. 16-1

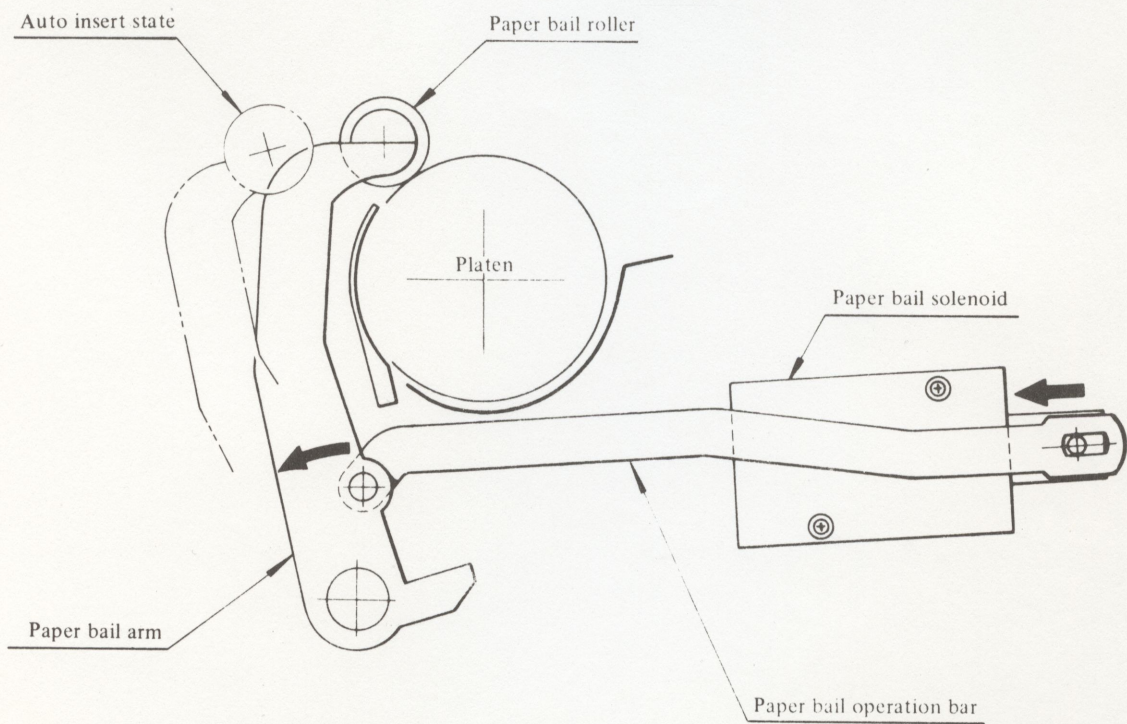


Fig. 16-2



## 17. PAPER BAIL

### 17.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of paper bail arm L  
Remove the spring for paper bail arm L and then remove the screw. Remove paper bail arm L as unfitted from the paper bail scale. (Fig. 17-1)
- (3) Removal of paper bail arm R  
Remove the E-ring from the paper bail operation bar, remove the spring for paper bail arm R and then remove the screw.  
Remove paper bail arm R as unfitted from the paper bail scale. (Fig. 17-1)
- (4) Removal of paper bail scale  
Remove paper bail rollers from the paper bail scale.
- (5) Disassembly of paper bail rollers  
Paper bail roller shafts and a paper bail roller set spring are fitted in each paper bail roller, and they are easily removed when pressed by a finger.

### 17.2 Attachment

- (1) Paper bail rollers  
Fit a paper bail roller shaft into a paper bail roller on one side only. Fit the assembly into the paper bail scale from the side fitted with a paper bail roller shaft. Fit a paper bail roller set spring and finally push another paper bail roller shaft into the paper bail roller. (Fig. 17-2)

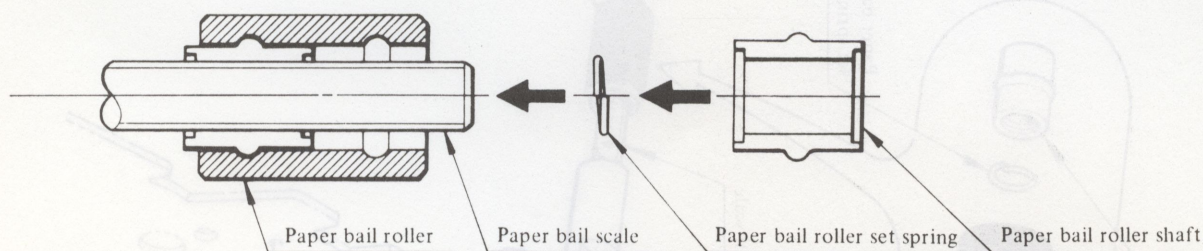


Fig. 17-2

- (2) Attachment is reverse order of removal.



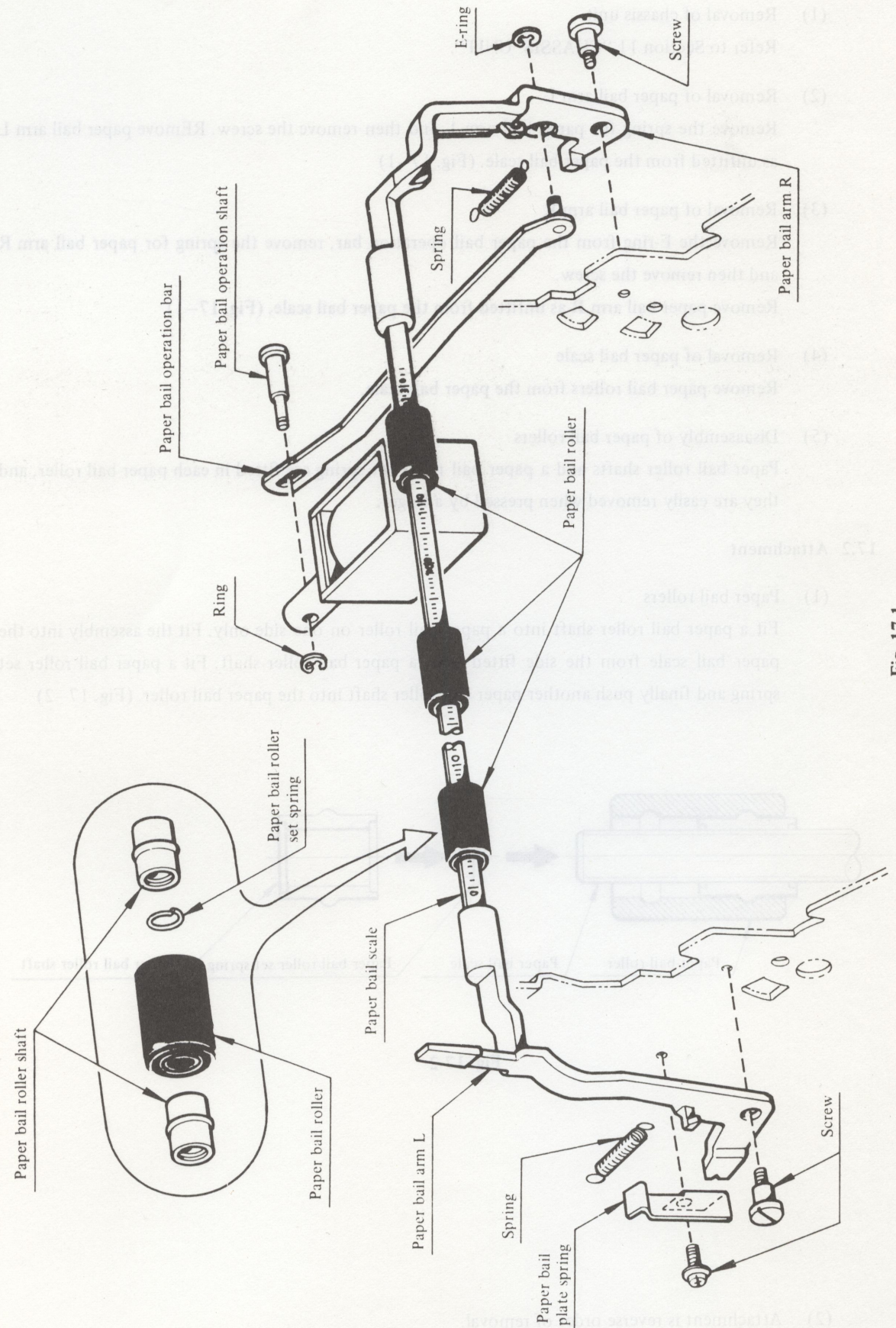


Fig. 17-1



### 17.3 Adjustment and Checks

(1) Paper bail rollers

Paper bail rollers should move rightward and leftward along the paper bail scale. They should stop at arbitrary positions by the force of paper bail roller set springs and should lightly rotate. When paper bail rollers are in contact with the platen surface under pressure, all of three paper bail rollers should rotate when the platen rotates.

(2) Locking of paper bail arm L

Adjust the position of the paper bail plate spring by the screw so that paper bail arm L can be lightly locked in the position reached when it is lightly pulled to this side and that it will not be locked by auto insert operation.

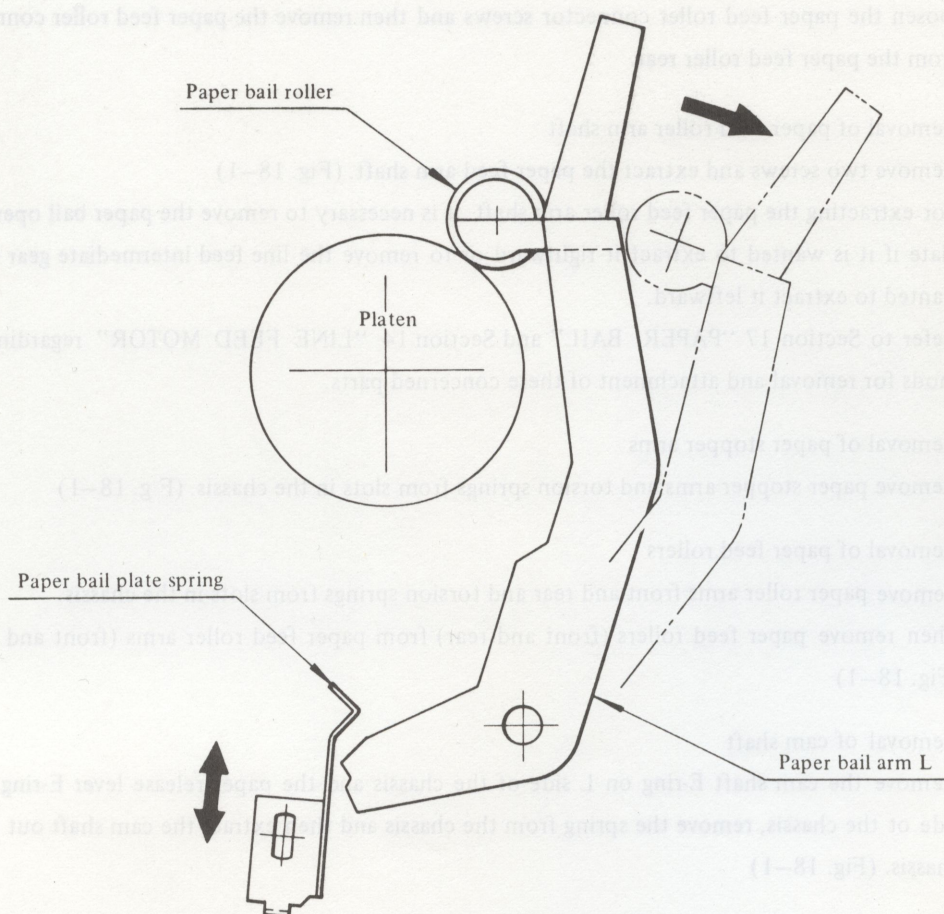


Fig. 17-3

### 17.4 Tools

Plus Driver (NO-1)

Hook for spring

Driver (70 m/m)

Plier (150 m/m)



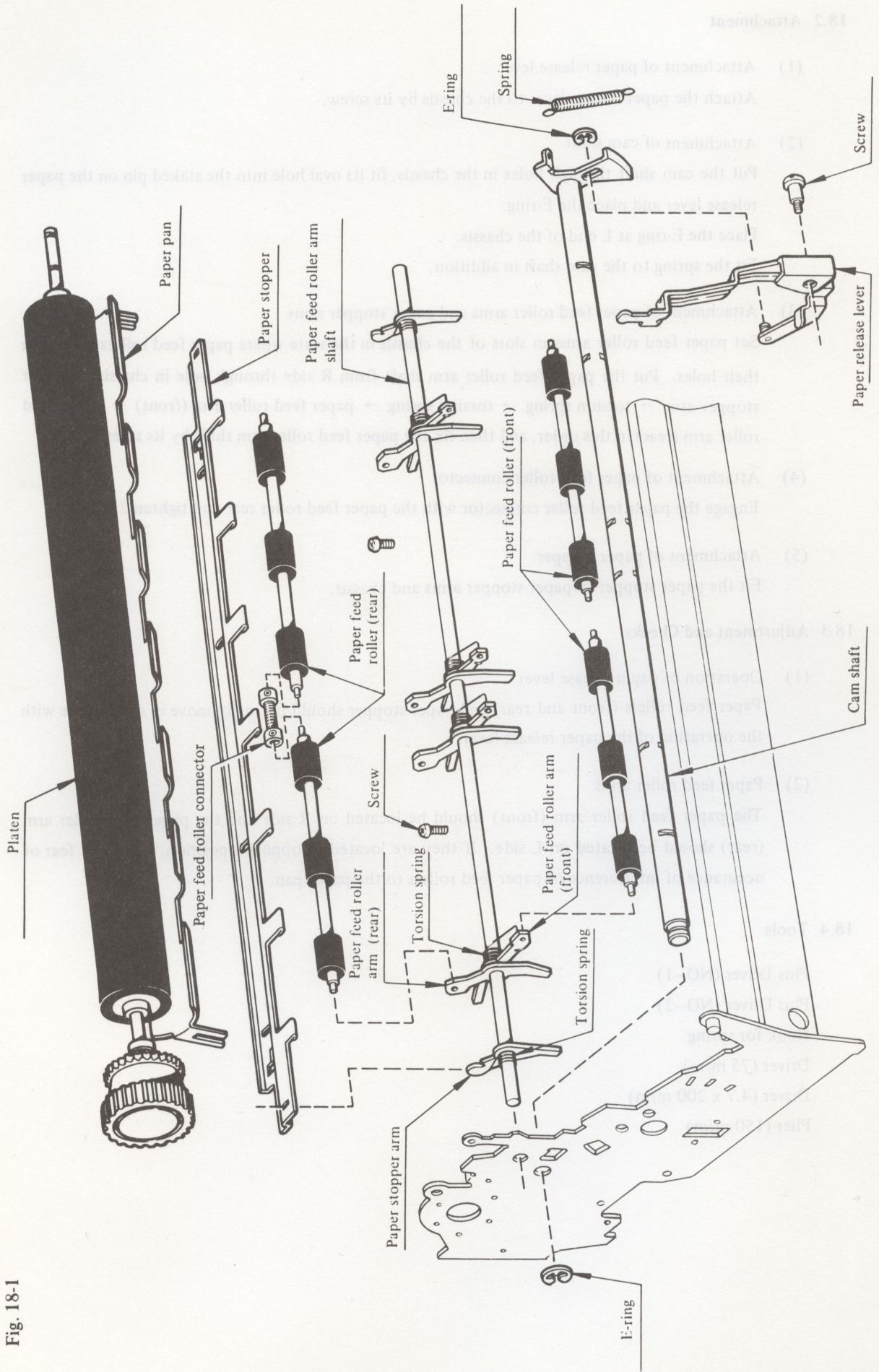
## 18. PAPER FEED ROLLERS AND PAPER STOPPER

### 18.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of platen and paper pan  
Remove the platen and the paper pan. (Fig. 18-1)
- (3) Removal of paper stopper  
Remove the paper stopper from paper stopper arms and chassis. (Fig. 18-1)
- (4) Removal of paper feed roller connector  
loosen the paper feed roller connector screws and then remove the paper feed roller connector from the paper feed roller rear.
- (5) Removal of paper feed roller arm shaft  
Remove two screws and extract the paper feed arm shaft. (Fig. 18-1)  
For extracting the paper feed roller arm shaft, it is necessary to remove the paper bail operation plate if it is wanted to extract it rightward or to remove the line feed intermediate gear if it is wanted to extract it leftward.  
Refer to Section 17 "PAPER BAIL" and Section 14 "LINE FEED MOTOR" regarding methods for removal and attachment of these concerned parts.
- (6) Removal of paper stopper arms  
Remove paper stopper arms and torsion springs from slots in the chassis. (Fig. 18-1)
- (7) Removal of paper feed rollers  
Remove paper roller arms front and rear and torsion springs from slots in the chassis.  
Then remove paper feed rollers (front and rear) from paper feed roller arms (front and rear). (Fig. 18-1)
- (8) Removal of cam shaft  
Remove the cam shaft E-ring on L side of the chassis and the paper release lever E-ring on R side of the chassis, remove the spring from the chassis and then extract the cam shaft out of the chassis. (Fig. 18-1)
- (9) Removal of paper release lever  
Remove the paper release lever with its screw removed. (Fig. 18-1)



Fig. 18-1





## 18.2 Attachment

### (1) Attachment of paper release lever

Attach the paper release lever to the chassis by its screw.

### (2) Attachment of cam shaft

Put the cam shaft through holes in the chassis, fit its oval hole into the staked pin on the paper release lever and place the E-ring.

Place the E-ring at L end of the chassis.

Fit the spring to the cam shaft in addition.

### (3) Attachment of paper feed roller arms and paper stopper arms

Set paper feed roller arms in slots of the chassis in the state where paper feed rollers are put in their holes. Put the paper feed roller arm shaft from R side through hole in chassis → paper stopper arm → torsion spring → torsion spring → paper feed roller arm (front) → paper feed roller arm (rear) in this order, and then fix the paper feed roller arm shaft by its screws.

### (4) Attachment of paper feed roller connector

Engage the paper feed roller connector with the paper feed roller rear and tighten 2 screws.

### (5) Attachment of paper stopper

Fit the paper stopper to paper stopper arms and chassis.

## 18.3 Adjustment and Checks

### (1) Operation of paper release lever

Paper feed rollers (front and rear) and paper stopper should normally move in accordance with the operation of the paper release lever.

### (2) Paper feed roller arms

The paper feed roller arm (front) should be located on R side and the paper feed roller arm (rear) should be located on L side. If they are located in opposite position, there is a fear of occurrence of interference of paper feed rollers to the paper pan.

## 18.4 Tools

Plus Driver (NO-1)

Plus Driver (NO-2)

Hook for spring

Driver (75 m/m)

Driver (4.7 x 200 m/m)

Plier (150 m/m)



## 19. COVER SWITCH

### 19.1 Removal

- (1) Removal of upper cover  
Refer to Section 1 "UPPER COVER".
- (2) Disconnection of connector  
Disconnect the connector for the cover switch from the driver circuit board.
- (3) Removal of cover switch unit  
Remove the cover switch unit with its screws removed.
- (4) Disassembly of cover switch unit  
The cover switch is of such a composition that is shown in Fig. 19-1, and it can be disassembled by removing the spring and screws.

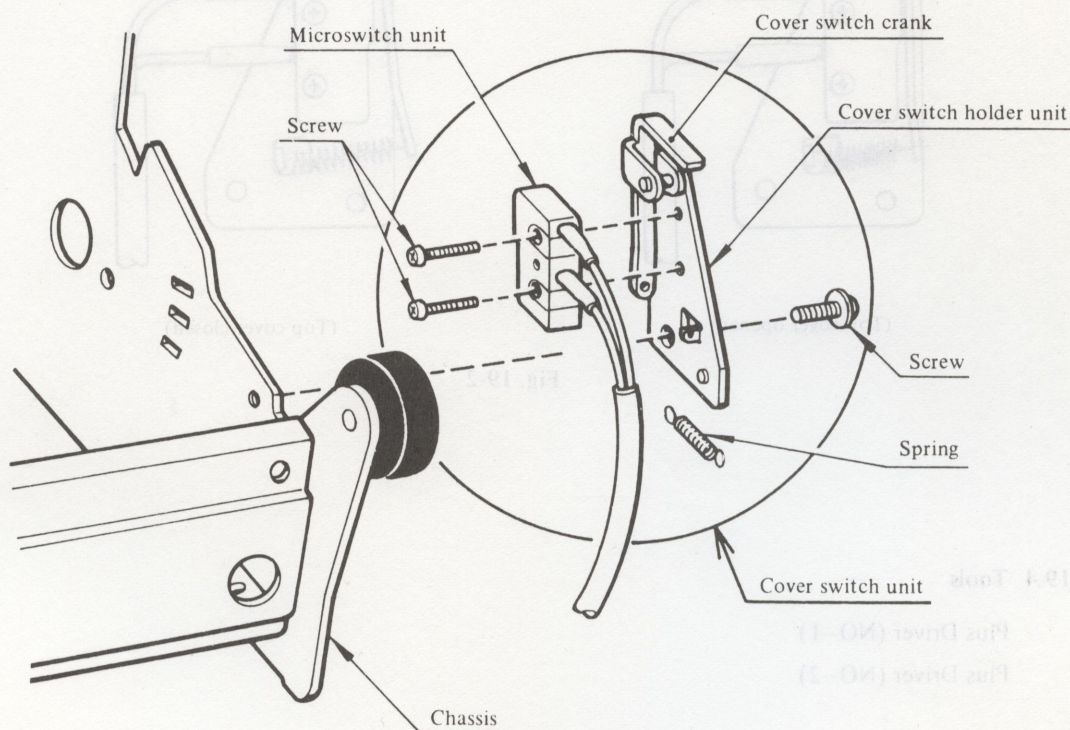


Fig. 19-1

### 19.2 Attachment

Attachment is reverse order of removal.



### 19.3 Adjustment and Checks

#### (1) Operation of cover switch

Mount the upper cover and make adjustment by suitably bending the cover switch crank so that 24V DC circuit opens when the top cover is opened up and the circuit is closed when the top cover is closed. (Fig. 19-2)

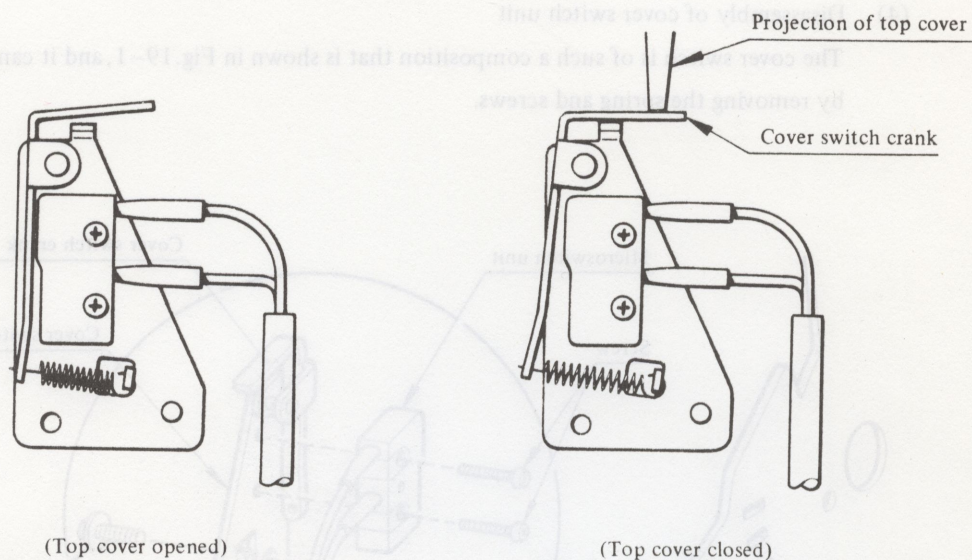


Fig. 19-2

### 19.4 Tools

Plus Driver (NO-1)

Plus Driver (NO-2)



## 20. CARRIER UNIT

### 20.1 Removal

- (1) Removal of upper cover  
Refer to Section 1 "UPPER COVER".
- (2) Removal of keyboard unit  
Refer to Section 2 "KEYBOARD UNIT".
- (3) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (4) Removal of carrier drive wire  
Loosen the rope holder plate screw and disconnect the drive wire from the carrier body. (Fig. 20-1)
- (5) Removal of carrier guide shaft  
(R side)  
Remove the carrier guide shaft screw, and then remove the carrier guide shaft collar and spring washer.  
(L side)  
Remove the carrier adjust lever with its screw loosened. Remove the carrier guide shaft holder nuts and remove screws.  
(It is not necessary to remove them for carrier guide shaft holder R.)
- (6) Removal of carrier unit  
Remove both stopper rubber L and R from the chassis, move the carrier head rightward and disengage the carrier body from the chassis.  
  
Lift R side of the carrier guide shaft and extract L end of the carrier guide shaft, and remove the carrier unit together with the guide shaft.  
Extract the carrier guide shaft and carrier guide shaft holders.



## 20.2 Attachment

### (1) Attachment of carrier unit

Put the carrier guide shaft through carrier guide shaft bearing and fit a carrier guide shaft holder to L end of the carrier guide shaft.

Hold the carrier guide shaft and set it to the chassis by putting into the hole in the chassis on L side and engage the carrier body with the chassis.

### (2) Attachment of carrier guide shaft

(R side)

Fit the spring washer and carrier guide shaft collar on the carrier guide shaft screw and temporarily fix the carrier guide shaft.

(L side)

Attach the carrier guide shaft holder by screws and nuts.

Attach the carrier adjust lever and fix it by its screw.

(R side)

Firmly tighten the carrier guide shaft screw.

### (3) Attachment of stopper rubbers

Fix stopper rubbers L and R to the chassis.

### (4) Attach the remaining parts in the sequence opposite to that of removal.



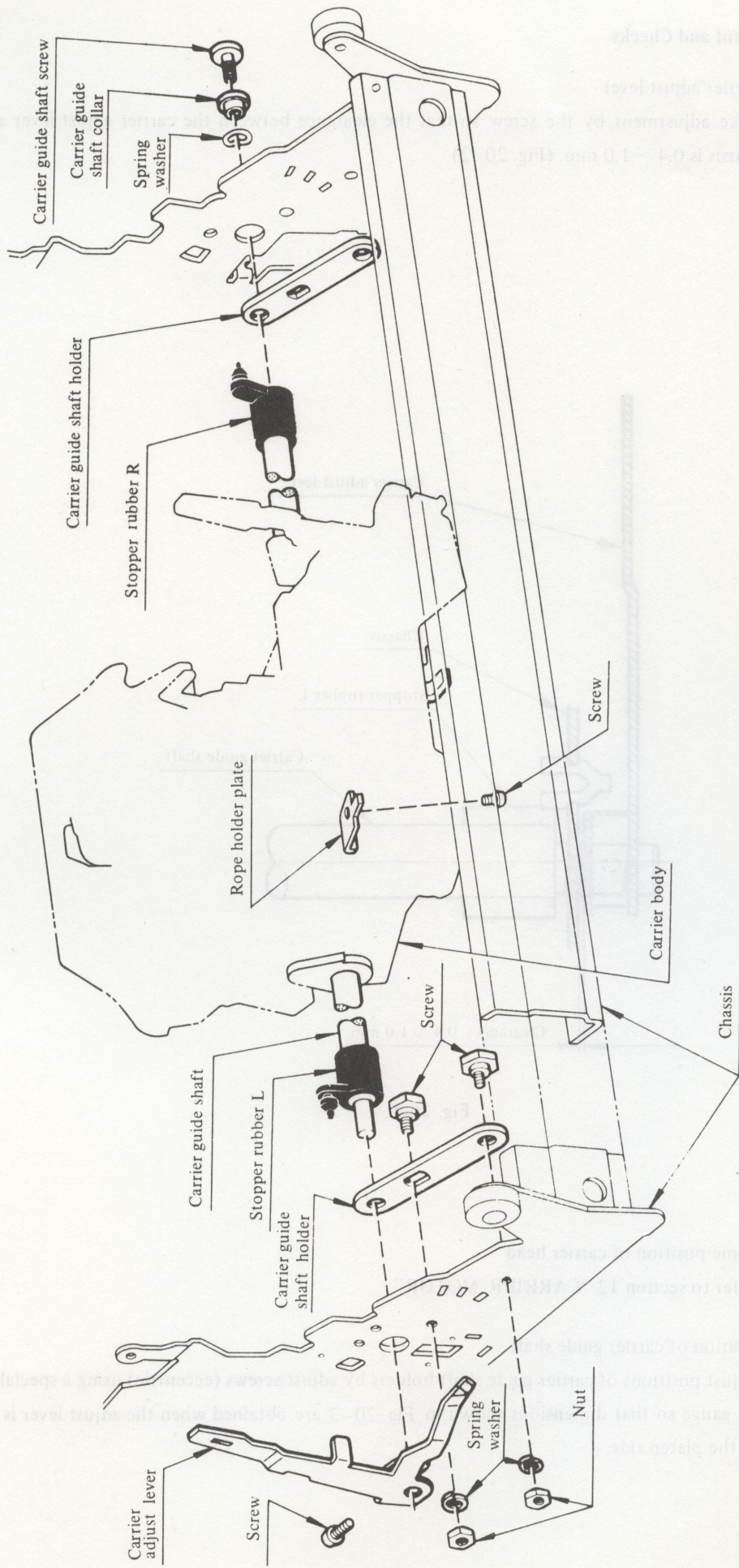


Fig. 20-1



### 20.3 Adjustment and Checks

(1) Carrier adjust lever

Make adjustment by the screw so that the clearance between the carrier adjust lever and the chassis is 0.4 ~ 1.0 mm. (Fig. 20-2)

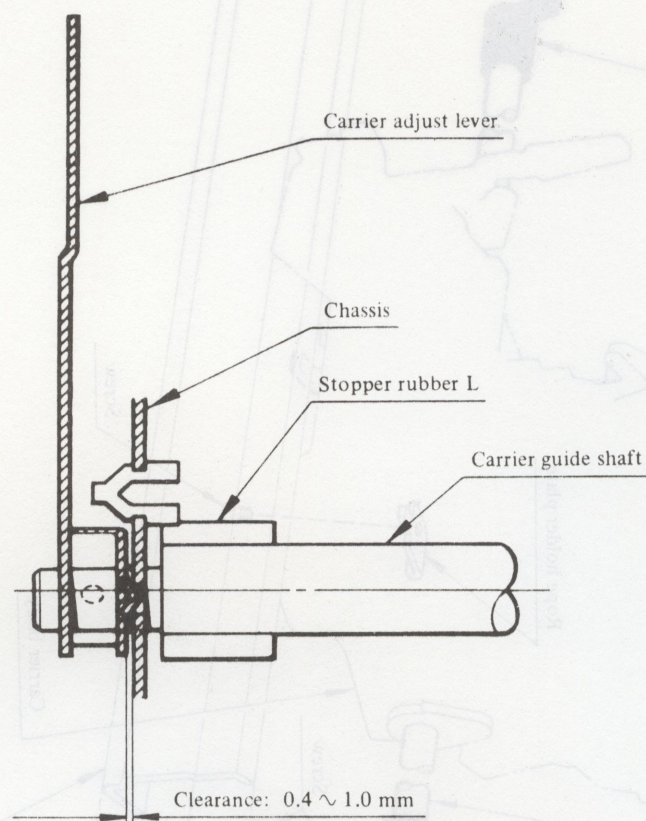


Fig. 20-2

(2) Home position of carrier head

Refer to section 12 "CARRIER MOTOR".

(3) Position of carrier guide shaft

Adjust positions of carrier guide shaft holders by adjust screws (eccentric) using a special adjusting gauge so that dimensions shown in Fig. 20-3 are obtained when the adjust lever is located on the platen side.



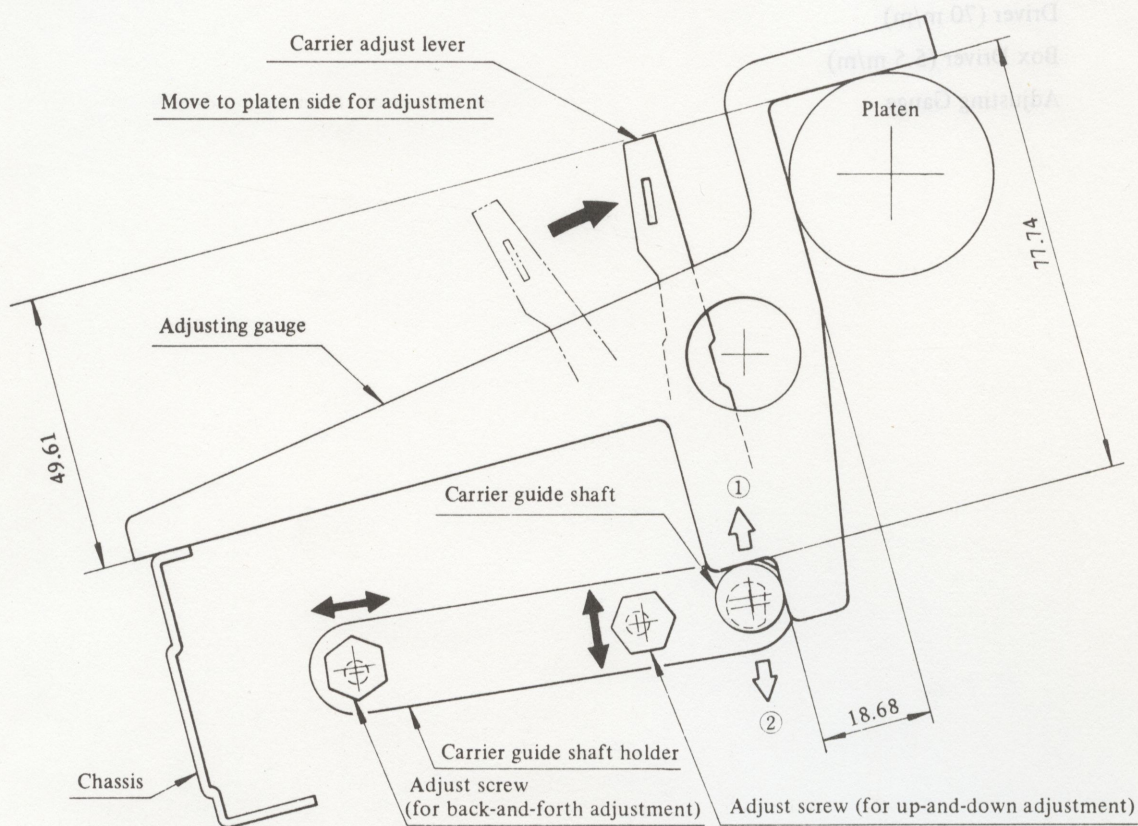


Fig. 20-3

If the print impression is stronger on the upper side or lower side of each character, move the carrier guide shaft upward or downward by adjust screw (for up-and-down adjustment).

If impression is stronger on the upper side of  
a character ..... Move the carrier guide shaft upward (direction ① )

If impression is stronger on the lower side of  
a character ..... Move the carrier guide shaft downward (direction ② )

But care should be exercised in the relation with the print line position marked on the paper meter.  
(Refer to Section 30 "PAPER METER".)

Make adjustment at both L and R ends and the difference between L and R ends should not exceed  
0.2 mm in either back-and-forth direction or up-and-down direction.



20.4 Tools

- Plus Driver (NO-1)
- Box Driver (7.0 m/m)
- Spanner (8.0 x 10 m/m)
- Driver (70 m/m)
- Box Driver (5.5 m/m)
- Adjusting Gauge

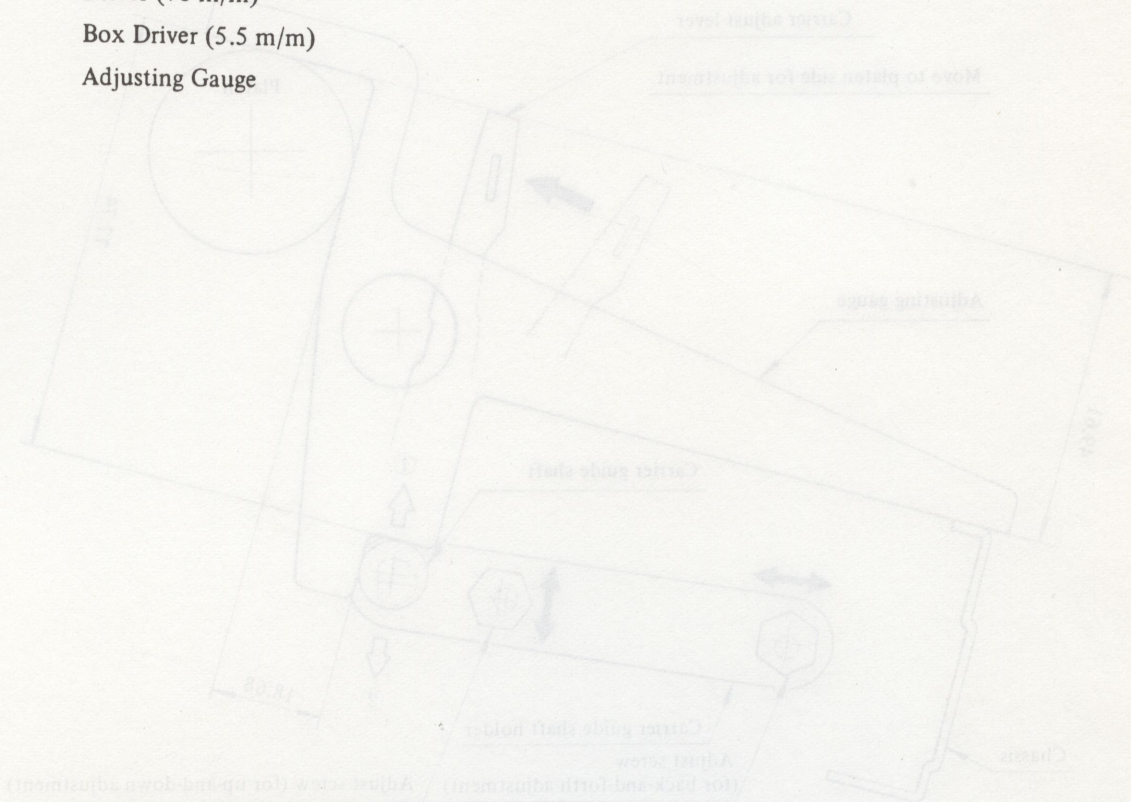


Fig. 20-3

If the print impression is stronger on the upper side of each character, move the carrier guide shaft upward or downward by adjust screw (for up-and-down adjustment).

If impression is stronger on the upper side of a character, ..... Move the carrier guide shaft upward (direction 1).

If impression is stronger on the lower side of a character, ..... Move the carrier guide shaft downward (direction 2).

But care should be exercised in the relation with the print line position marked on the paper meter. (Refer to Section 30 "PAPER METER".)

Make adjustment at both L and R ends and the difference between L and R ends should not exceed 0.2 mm in either back-and-forth direction or up-and-down direction.



## 21. RELAY CIRCUIT BOARD

### 21.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Disconnection of connectors  
Disconnect all connectors from the relay circuit board. (Fig. 21-2)
- (3) Removal of relay circuit board  
Remove the cable holder with its screws removed.  
Remove the relay circuit board from the carrier body, and remove the flat cable protective film from the flat cable. (Fig. 21-1)  
  
\* The flat cable is unitized with the relay circuit board and cannot be disconnected from it.
- (4) Removal of insulation paper  
Remove the insulation paper from the carrier body. (Fig. 21-1)

### 21.2 Attachment

- (1) Attachment of insulation paper  
Fit the insulation paper to the carrier body.
- (2) Attachment of relay circuit board  
Fit the relay circuit board to the carrier body and tighten screws on the opposite side to the cable side.  
Fit the cable protection film to the flat cable, hold it by the cable holder, and then tighten screws on the cable side.  
Lay lead wires through notches in the relay circuit board. As notches are provided at two places, attach the relay circuit board to the body in such a manner that specified lead wires are laid through specified notches. Refer to Fig. 21-2 for the details. Do not lay lead wires for ribbon lift or correction through notches.
- (3) Connection of connectors  
Connect connector to the relay circuit board with number of pins and color of connectors suitably matched, in the following sequence.



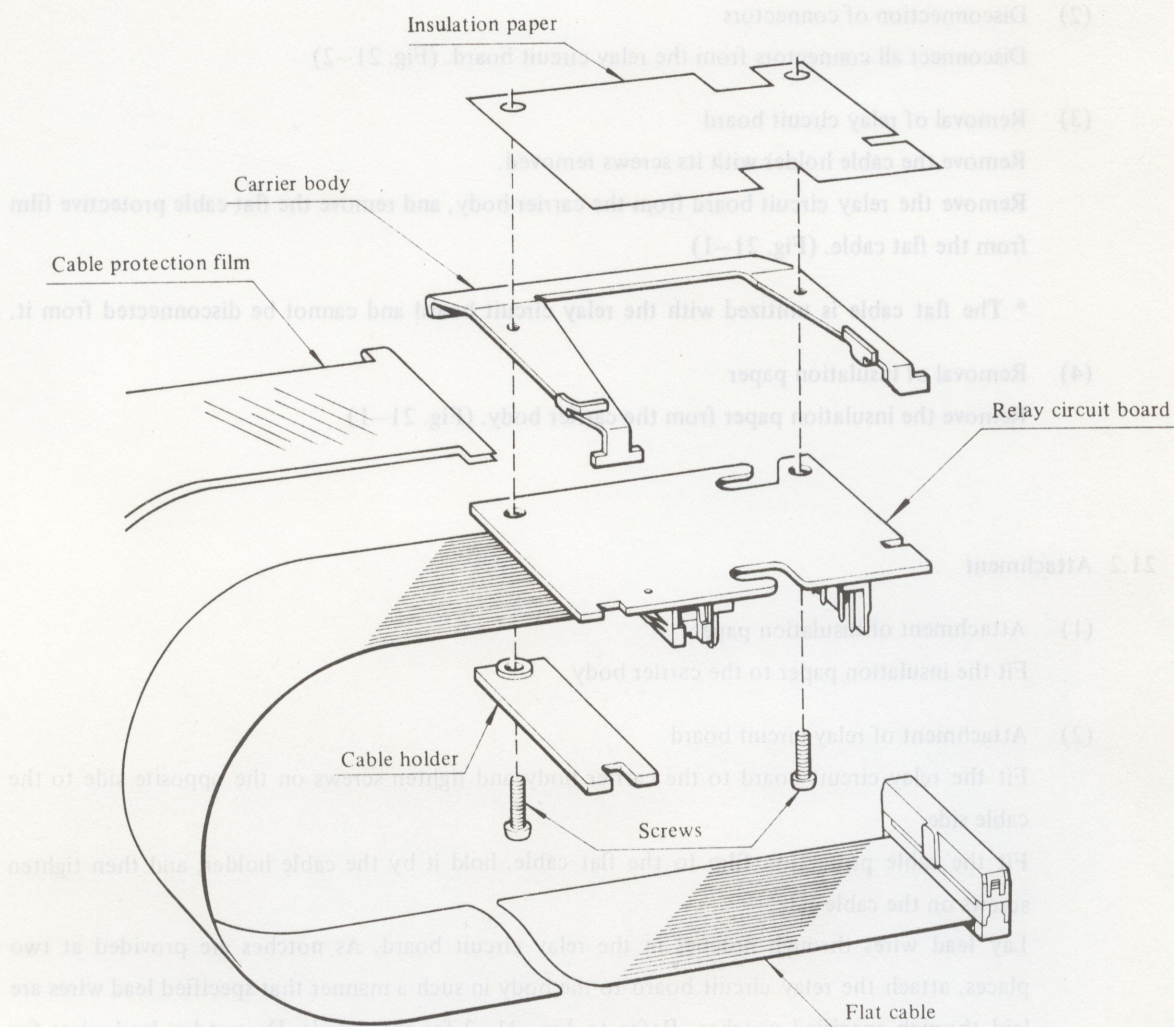


Fig. 21-1



1 → 2 → 3 → 4 → 5 → 6 → 7 → 8  
 J21 J23 J22 J27 J26 J24 J28 J25

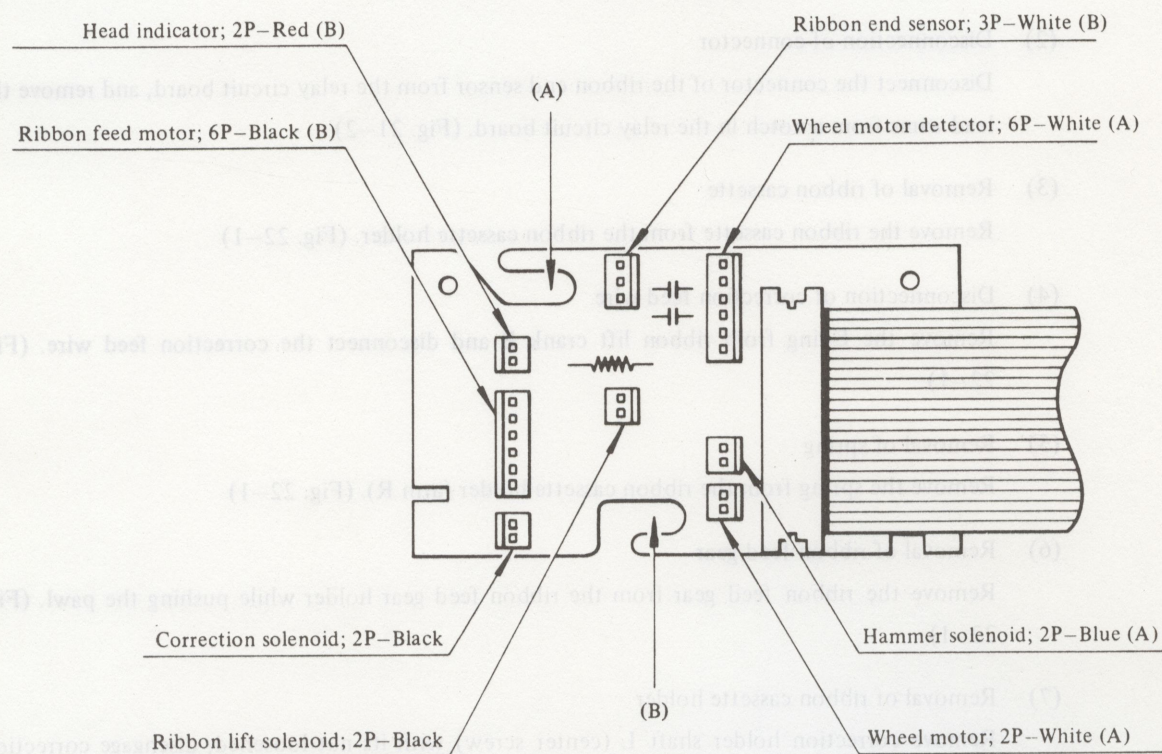


Fig. 21-2

### 21.3 Adjustment and Checks

#### (1) Connection of connectors

Identification of connectors is made by number of pins and color. Make correction with care exercised not to make errors in matching of number of pins and colors. (Fig. 21-2)

### 21.4 Tools

Plus Driver (NO-1)



## 22. RIBBON CASSETTE HOLDER

### 22.1 Removal

- (1) Removal of chassis unit

Refer to Section 11 "CHASSIS UNIT".

- (2) Disconnection of connector

Disconnect the connector of the ribbon end sensor from the relay circuit board, and remove the lead wires from a notch in the relay circuit board. (Fig. 21-2)

- (3) Removal of ribbon cassette

Remove the ribbon cassette from the ribbon cassette holder. (Fig. 22-1)

- (4) Disconnection of correction feed wire

Remove the E-ring from ribbon lift crank B and disconnect the correction feed wire. (Fig. 22-1)

- (5) Removal of spring

Remove the spring from the ribbon cassette holder (arm R). (Fig. 22-1)

- (6) Removal of ribbon feed gear

Remove the ribbon feed gear from the ribbon feed gear holder while pushing the pawl. (Fig. 22-1)

- (7) Removal of ribbon cassette holder

Remove correction holder shaft L (center screw) with its nut loosened, disengage correction holder shaft R from ribbon lift shaft, and then remove the ribbon cassette holder. (Fig. 22-1)

- (8) Disassembly of ribbon cassette holder

The ribbon cassette holder can be removed by the procedure described above.

The ribbon cassette holder is of such a composition that is shown in Fig. 22-2, and the procedure for its disassembly is described below. (Fig. 22-2)

The description for the ribbon end sensor is omitted here, as it is indicated in Section 28.

- (a) Removal of correction tape

Remove the correction tape.

- (b) Removal of cassette lock plate

Remove the spring for the cassette lock plate and then remove the cassette lock plate from the ribbon cassette holder.

- (c) Removal of ribbon cassette holder arms R & L

Remove screws (and nuts) for ribbon cassette holder arms R & L, and remove ribbon cassette holder arms R and L from the ribbon cassette holder.



## (d) Removal of correction spool R shaft

Remove the spring for the correction feed crank, remove the correction spool shaft nut, and then remove the correction spool R shaft from ribbon cassette holder arm R. When the correction spool R shaft is removed, correction ratchet wheel, correction feed crank, flat washer and spring washer are disassembled. Furthermore, the correction spool set spring can be removed from the correction ratchet wheel and the correction feed pawl and spring can be removed from the correction feed crank.

## (e) Removal of correction spool holder

The correction spool holder and correction R wheel set pawl can be removed when the E-ring is removed from the correction spool holder shaft. Remove the spring before removal of the correction spool holder.

## (f) Removal of correction spool spindle L

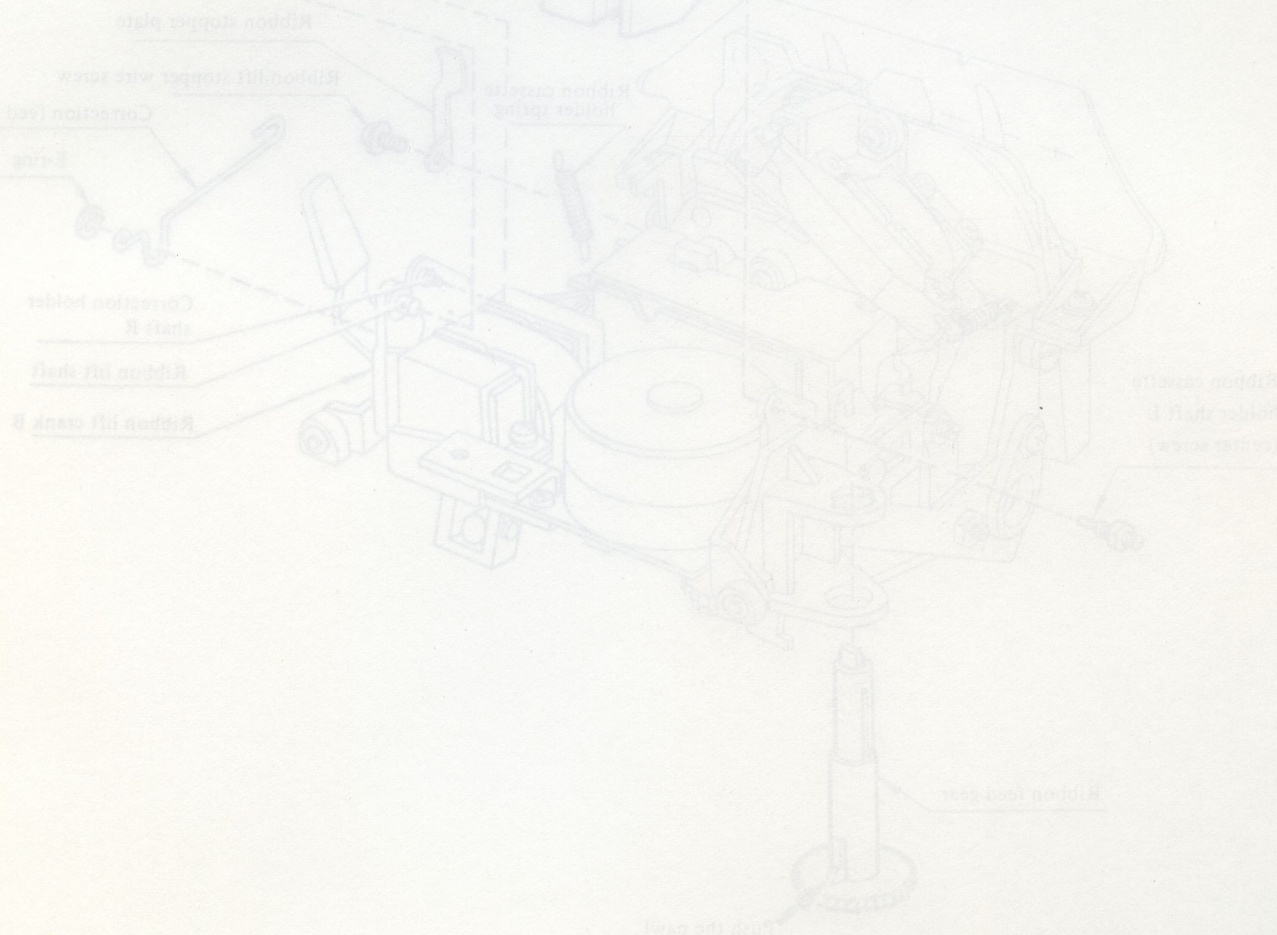
Remove the E-ring from correction spool shaft L, and then remove correction spool spindle L, spiral spring and correction spool shaft collar.

## (9) Removal of ribbon lift stopper plate

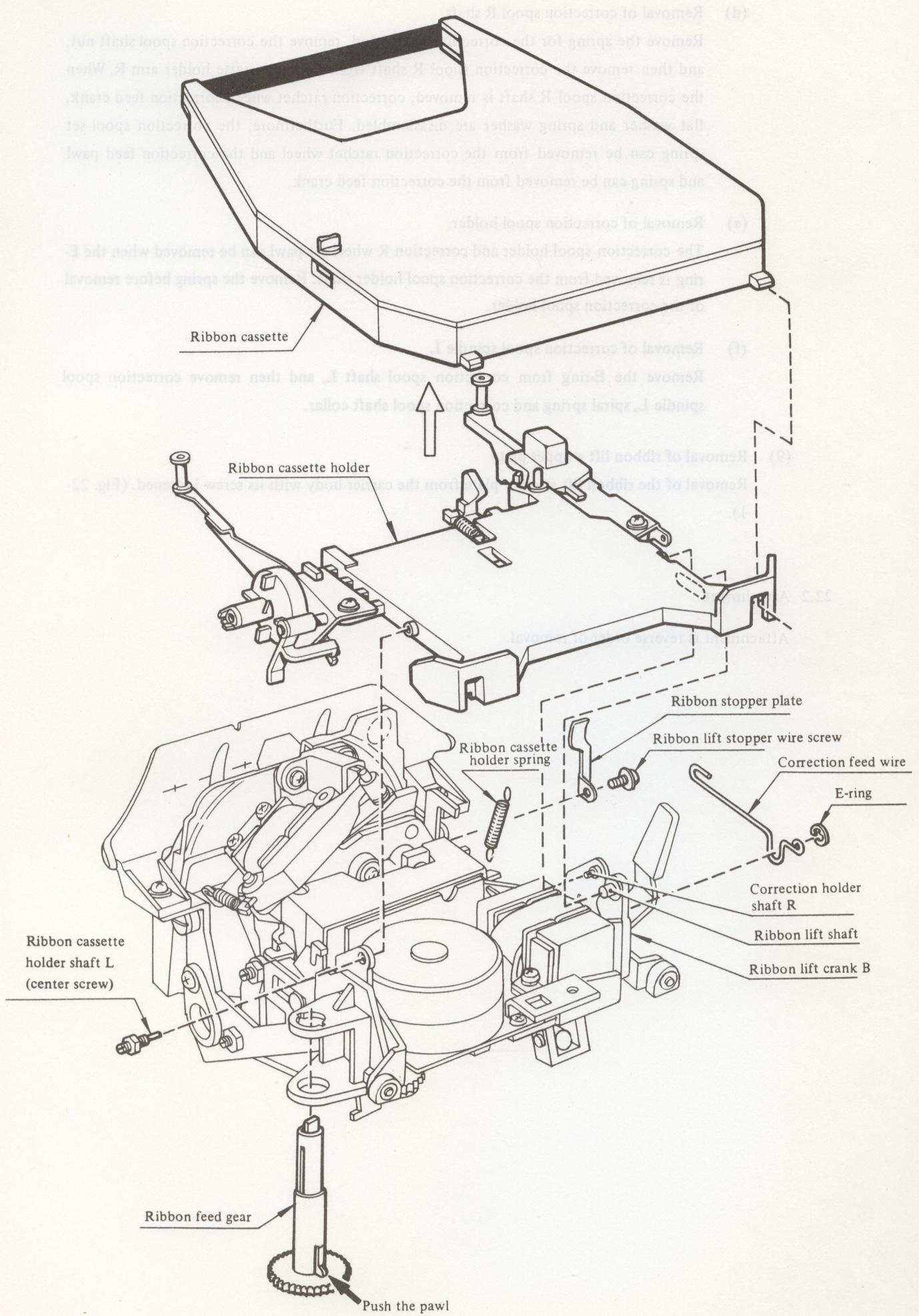
Removal of the ribbon lift stopper plate from the carrier body with its screw loosened. (Fig. 22-1).

## 22.2 Attachment

Attachment is reverse order of removal.









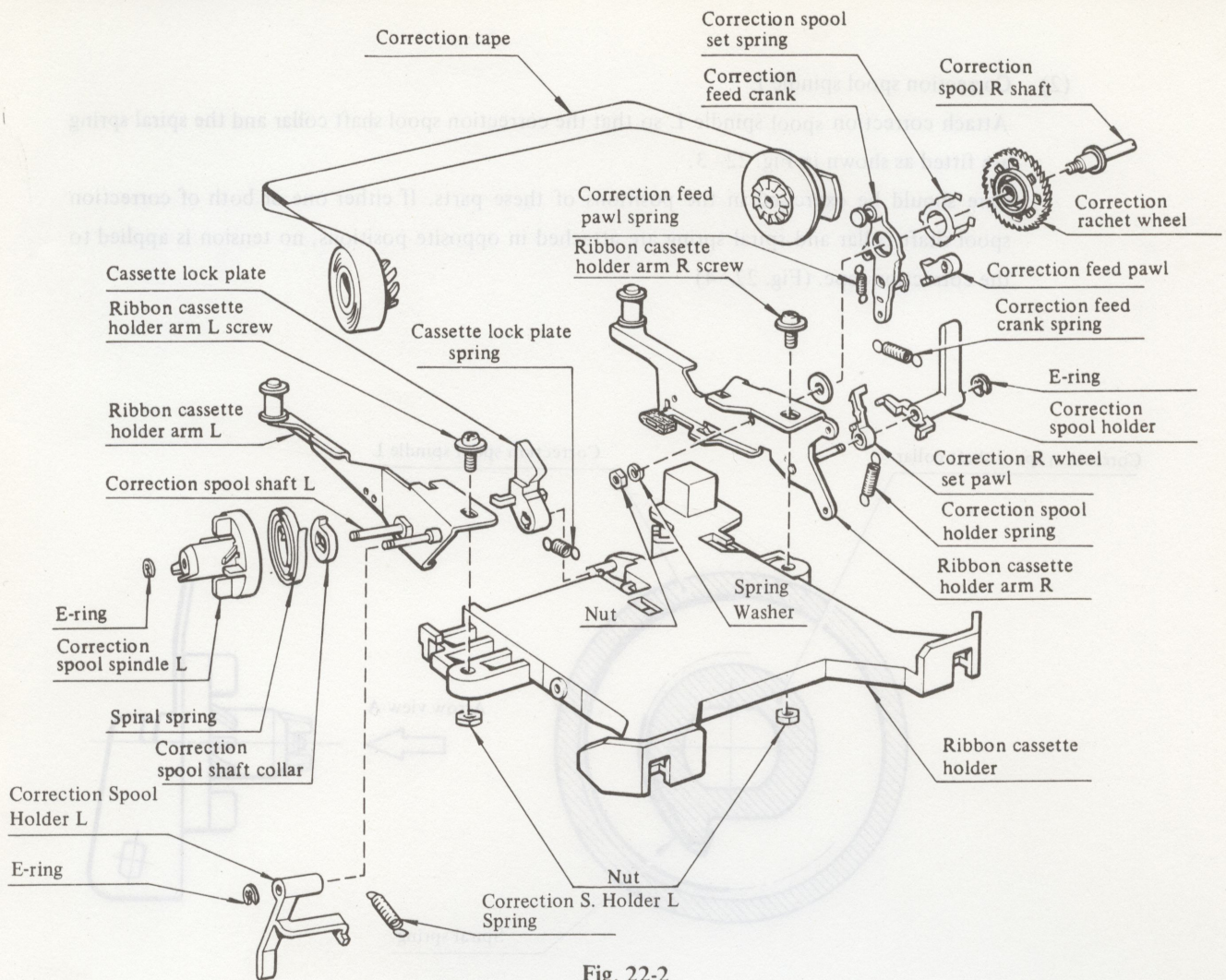


Fig. 22-2

### 22.3 Adjustment and Checks

#### (1) Play of center screw

Make adjustment by the correction holder shaft L so that its play to the cassette holder is 0.01 ~ 0.1 mm and that operation is performed by its tare weight.

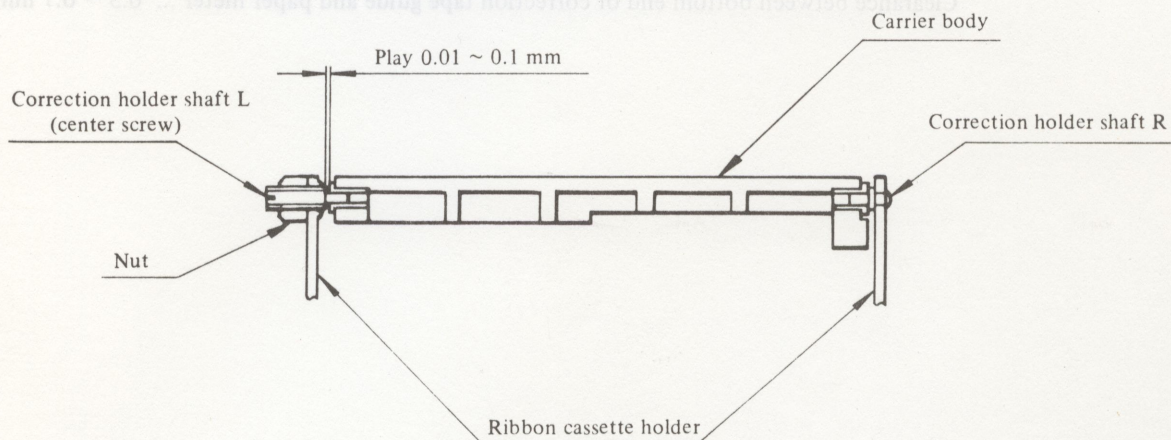


Fig. 22-3



## (2) Correction spool spindle L

Attach correction spool spindle L so that the correction spool shaft collar and the spiral spring are fitted as shown in Fig. 22-3.

Care should be exercised in the positions of these parts. If either one or both of correction spool shaft collar and spiral spring are attached in opposite positions, no tension is applied to the correction tape. (Fig. 22-4)

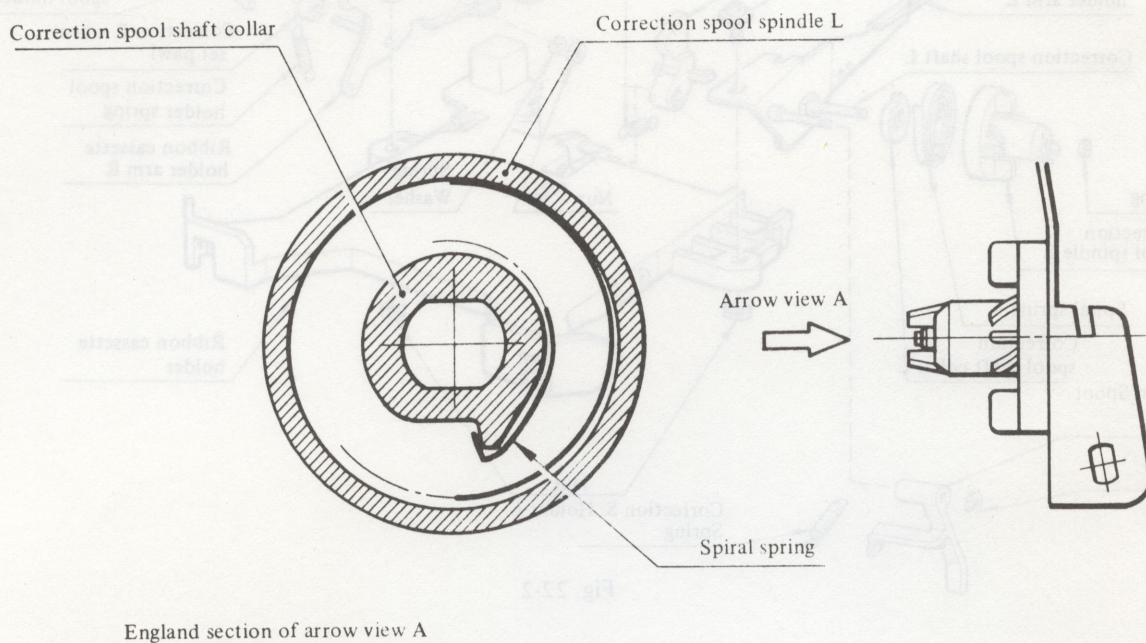


Fig. 22-4

## (3) Ribbon cassette holder arms R &amp; L

Adjust positions of ribbon cassette holder arms R & L by screws so that the clearance between the correction tape guide and the paper meter is as indicated below. (Fig. 22-5)

(At lifted point for correction ribbon)

Clearance between bottom end of correction tape guide and paper meter ... 0.3 ~ 0.7 mm



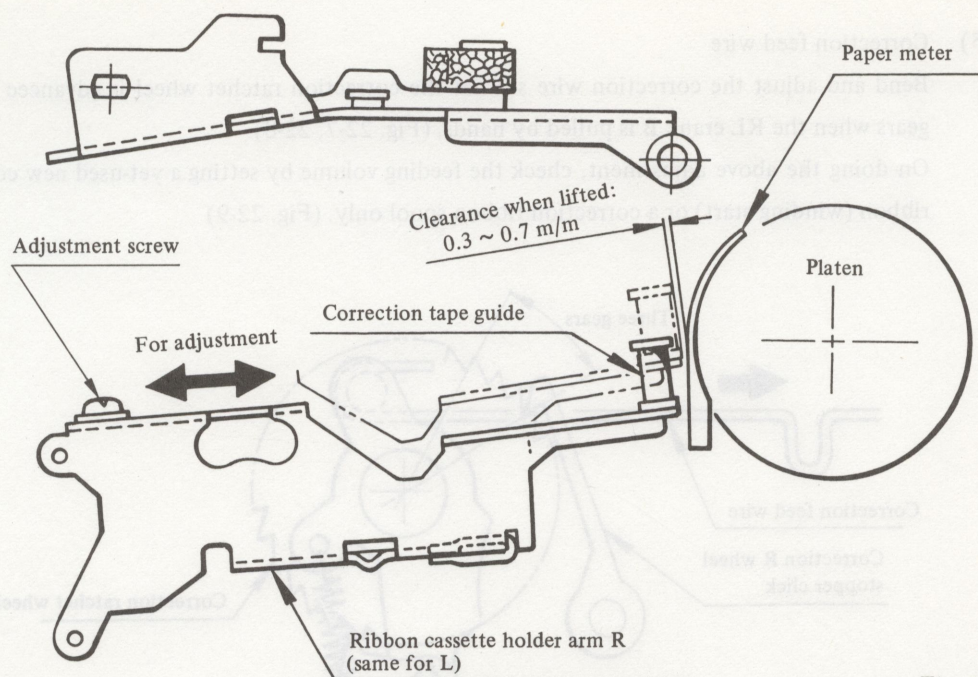


Fig. 22-5

#### (4) Ribbon lift stopper plate

The position of the ribbon lift stopper plate. Make adjustment so that the ribbon lift stopper plate at the stationary point has a clearance of 0.5 mm or more to the ribbon cassette holder stopper cork of the ribbon cassette holder arm R and that the clearance between the top end of the ribbon lift stopper plate and the stopper part of the carrier body is 0.5 mm or less.

(Fig. 22-6)

This adjustment can be made by moving the ribbon lift stopper plate with its screw loosened. If this adjustment is not made properly, the printing position of the cassette ribbon will be irregular.

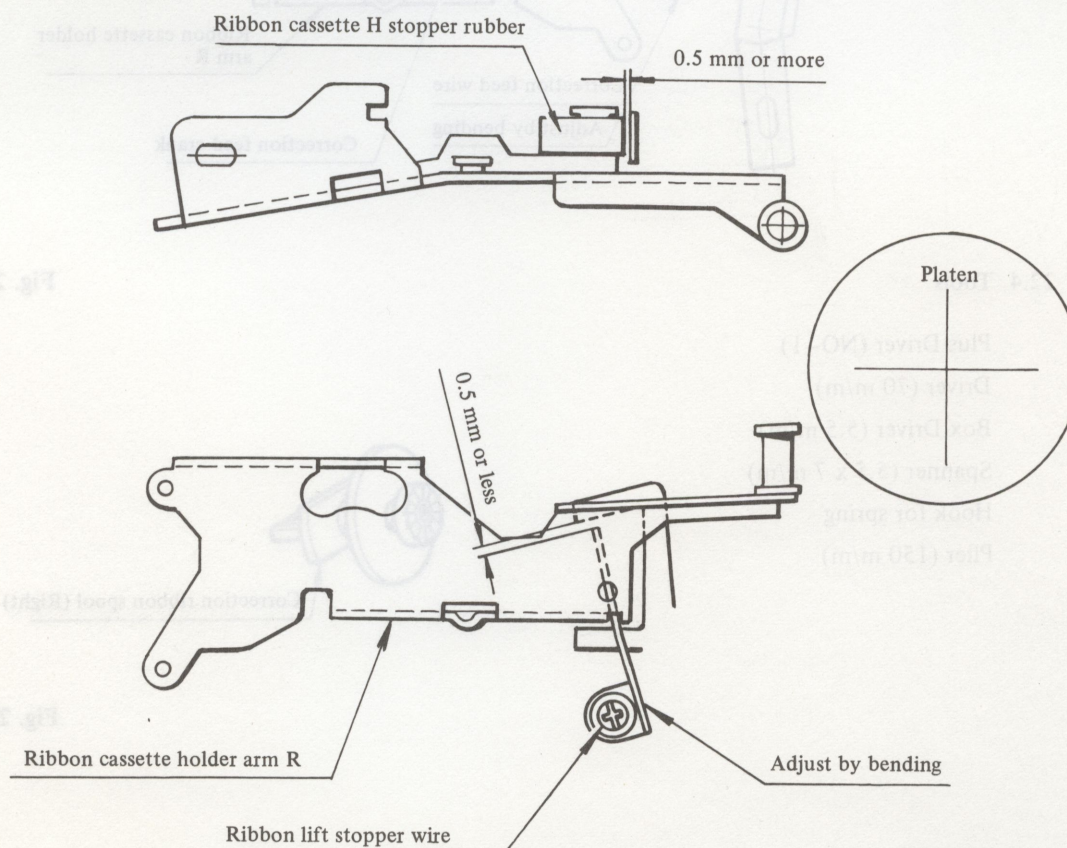


Fig. 22-6



## (5) Correction feed wire

Bend and adjust the correction wire so that the correction ratchet wheel is advanced by three gears when the RL crank B is pulled by hands. (Fig. 22-7, 22-8)

On doing the above adjustment, check the feeding volume by setting a yet-used new correction ribbon (winding start) or a correction ribbon spool only. (Fig. 22-9)

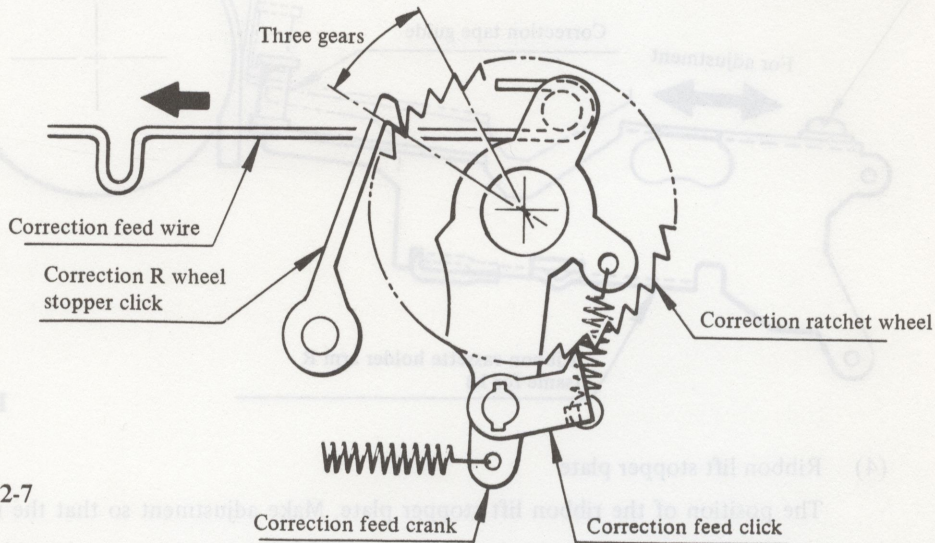


Fig. 22-7

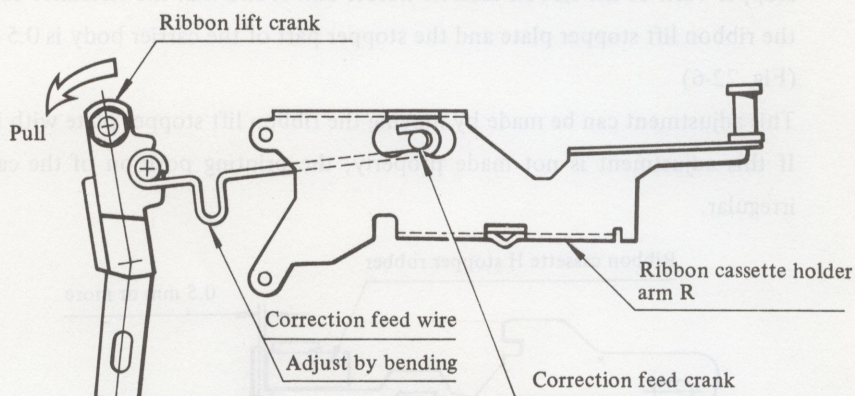


Fig. 22-8

## 22.4 Tools

- Plus Driver (NO-1)
- Driver (70 m/m)
- Box Driver (5.5 m/m)
- Spanner (5.5 x 7 m/m)
- Hook for spring
- Plier (150 m/m)

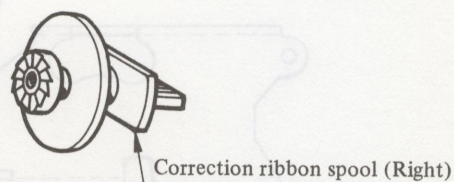


Fig. 22-9



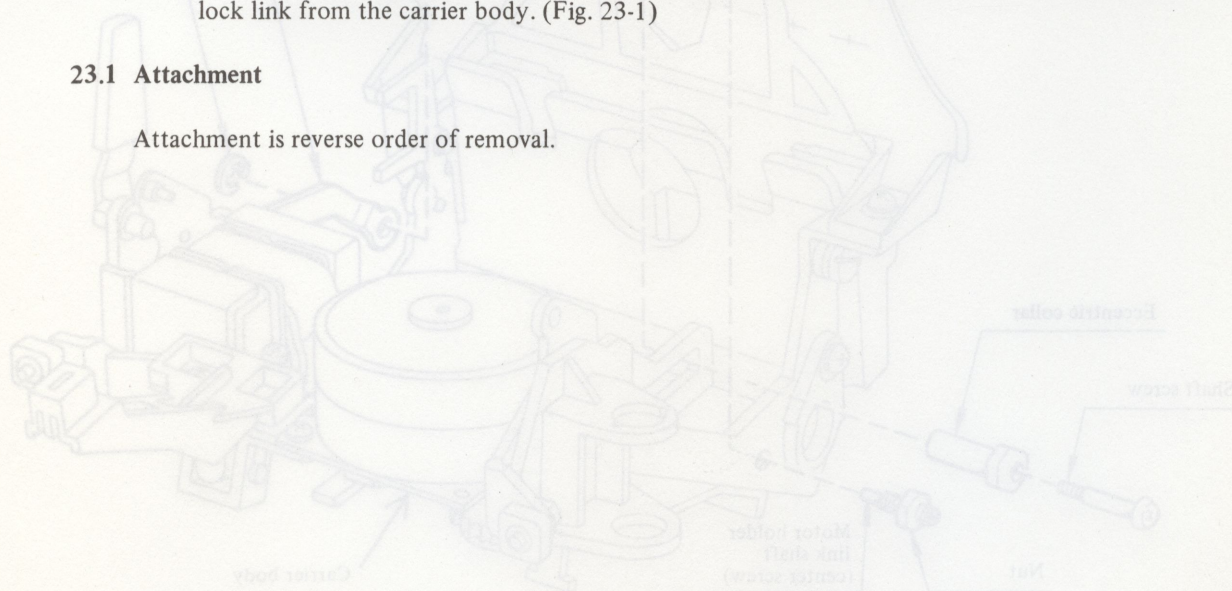
## 23. WHEEL MOTOR

### 23.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of relay circuit board  
Refer to Section 21 "RELAY CIRCUIT BOARD".
- (3) Removal of ribbon cassette holder  
Refer to Section 22 "RIBBON CASSETTE HODLER".
- (4) Removal of hammer solenoid  
Pull out the connector cord of hammer solenoid from relay harness on encoder cover, remove hammer solenoid screws and then remove the hammer solenoid from the wheel motor.  
(Fig. 23-1)
- (5) Removal of encoder cover  
Remove the encoder cover from the wheel motor. (Fig. 23-1)
- (6) Removal of spring and center screw  
Remove the spring from the wheel motor, and then remove motor holder link's wheel motor shaft (center screw) with its nut loosened. (Fig. 23-1)
- (7) Removal of shaft screw and eccentric collar  
Loosen the wheel motor shaft screw and remove the eccentric collar.
- (8) Removal of wheel motor  
Remove the wheel motor from the carrier body and motor holder link. (Fig. 23-1)
- (9) Removal of motor holder link  
Remove the motor lock link from the motor holder link with a E-ring removed.  
Remove the motor lock link shaft (center screw) with its nut loosened, and remove the motor lock link from the carrier body. (Fig. 23-1)

### 23.1 Attachment

Attachment is reverse order of removal.





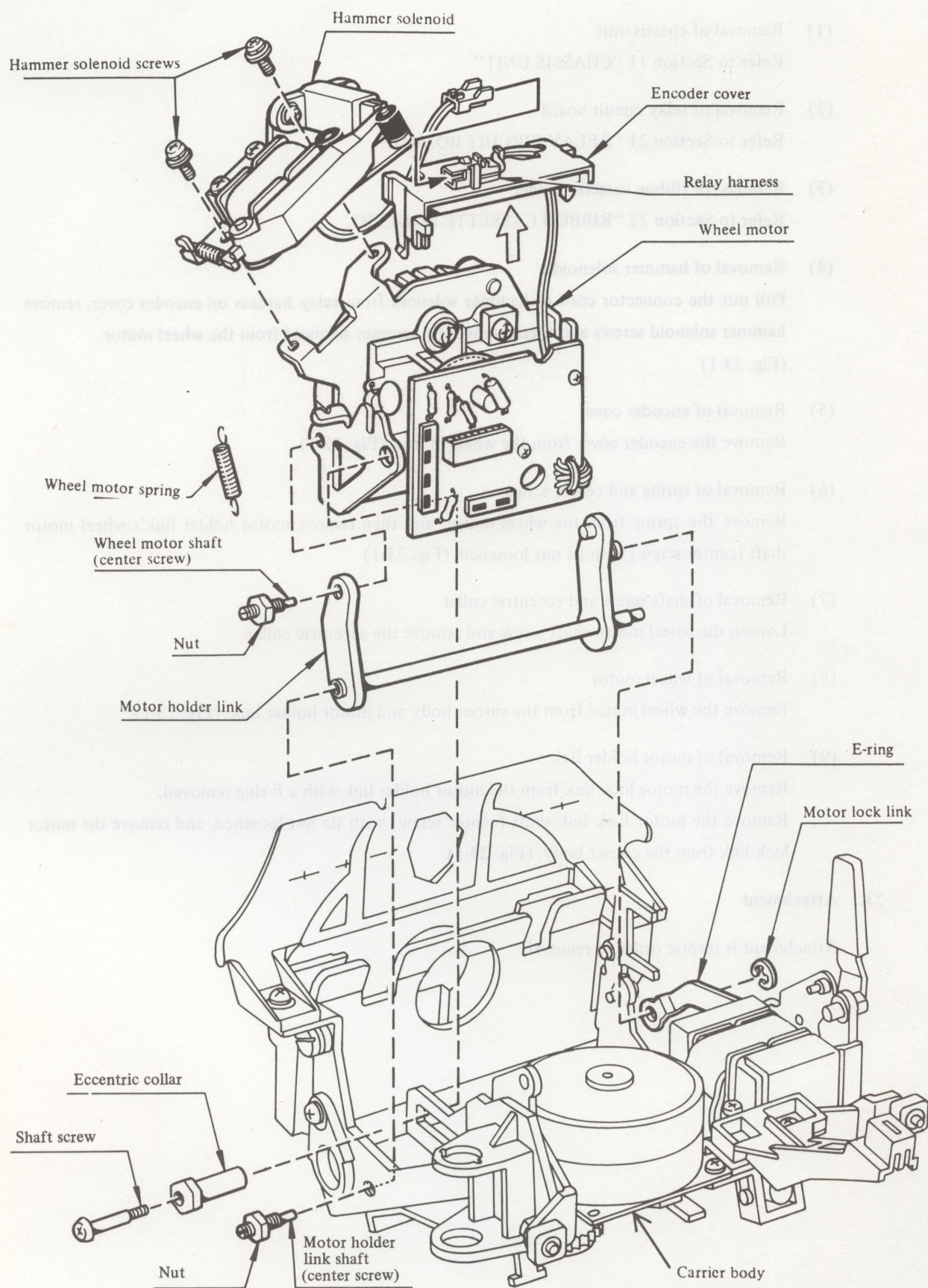


Fig. 23-1



### 23.3 Adjustment and Checks

#### (1) Play of center screw

Make adjustment by the wheel motor shaft (center screw) and motor holder link shaft (center screw) so that the play between the wheel motor and motor holder link and the play between the motor holder link and carrier body is 0.01 ~ 0.05 mm respectively and that operation is performed by their tare weights. (Fig. 23-2)

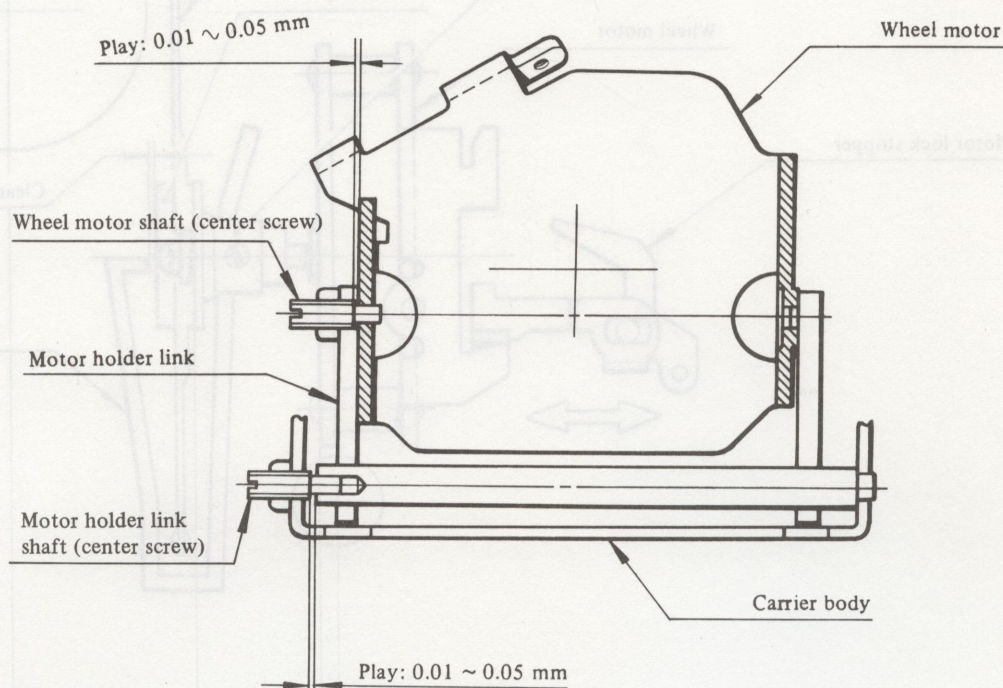
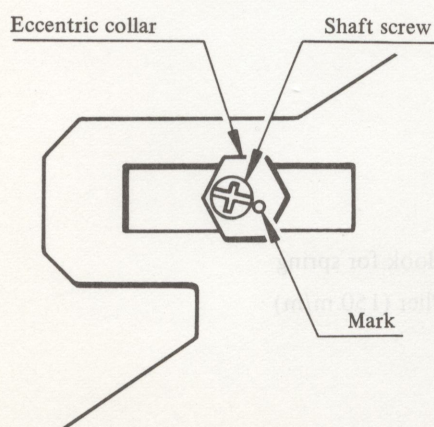


Fig. 23-2

#### (2) Position adjustment of wheel motor shaft screw and eccentric collar

Change the hammer angle and adjust the print thickness at both upper and lower portions by the position of eccentric collar.

Adjustment procedure is as follows:



1. Loosen the shaft screw and place the eccentric collar mark to the position slightly lower than the center line as illustrated.
2. Tighten the shaft screw and check lock and release operation of the wheel motor.
3. Print letters and check print thickness at both upper and lower portions. If one portion is blur, adjust the mark position again.



## (3) Clearance between PW cassette guide and print wheel

Make adjustment by moving the motor lock stopper back and forth so that the clearance between the PW cassette guide and PW cap is 0.2 ~ 0.5 mm (Fig. 23-3)

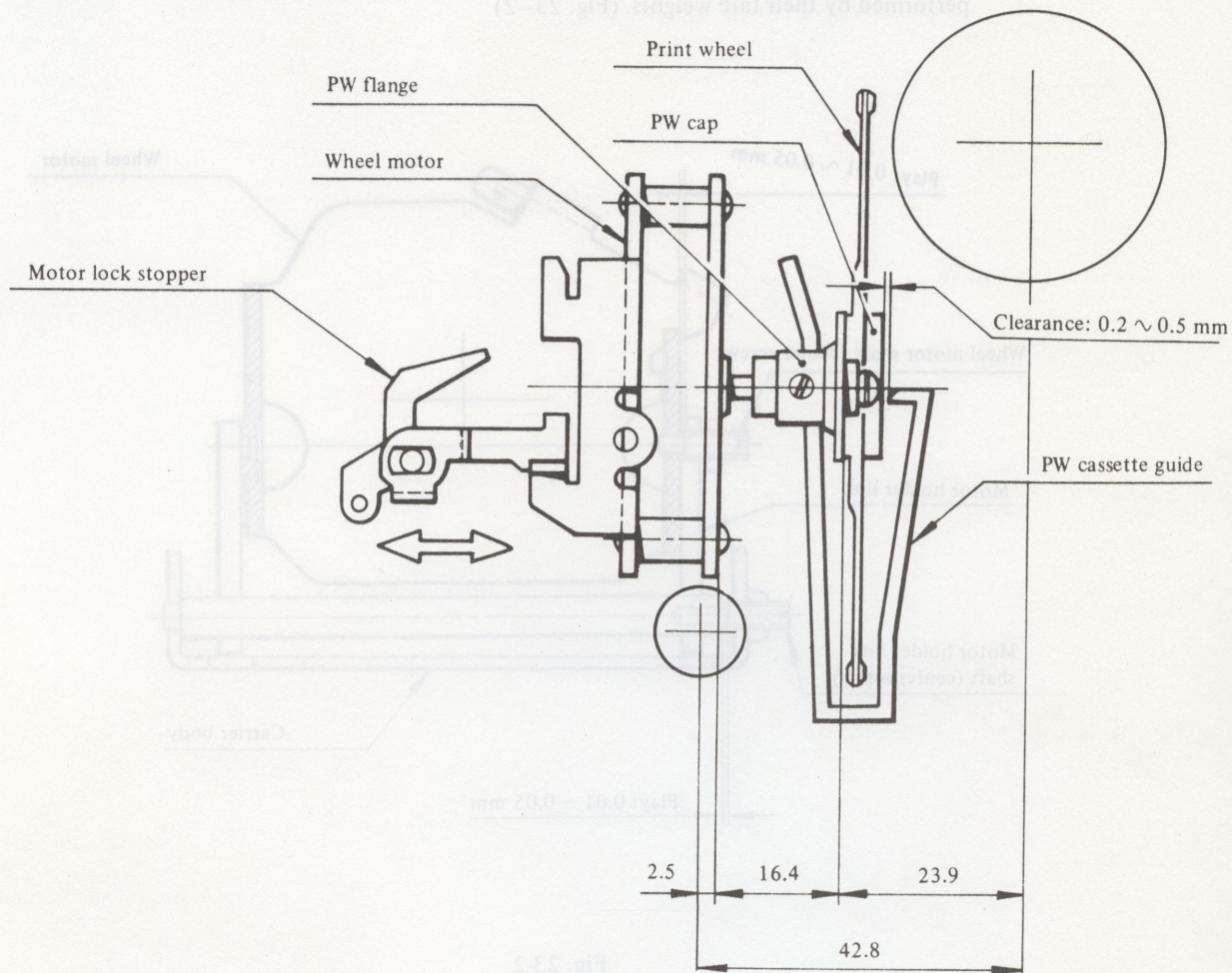


Fig. 23-3

## (4) Hammer position and inclination of printed characters

Refer to Section 24 "HAMMER SOLENOID".

## 23.4 Tools

Plus Driver (NO-1)

Driver (70 m/m)

Box Driver (7.0 m/m)

Box Driver (6.0 m/m)

Hook for spring

Plier (150 m/m)



## 24. HAMMER SOLENOID

### 24-1 Removal

- (1) Removal of upper cover

Refer to Section 1 "UPPER COVER"

- (2) Removal of hammer solenoid

Pull out the connector cord of hammer solenoid from relay harness on encoder cover, remove hammer solenoid screws and remove the hammer solenoid from the wheel motor. (Fig. 24-1)

### 24-2 Attachment

Attachement is reverse order of removal.

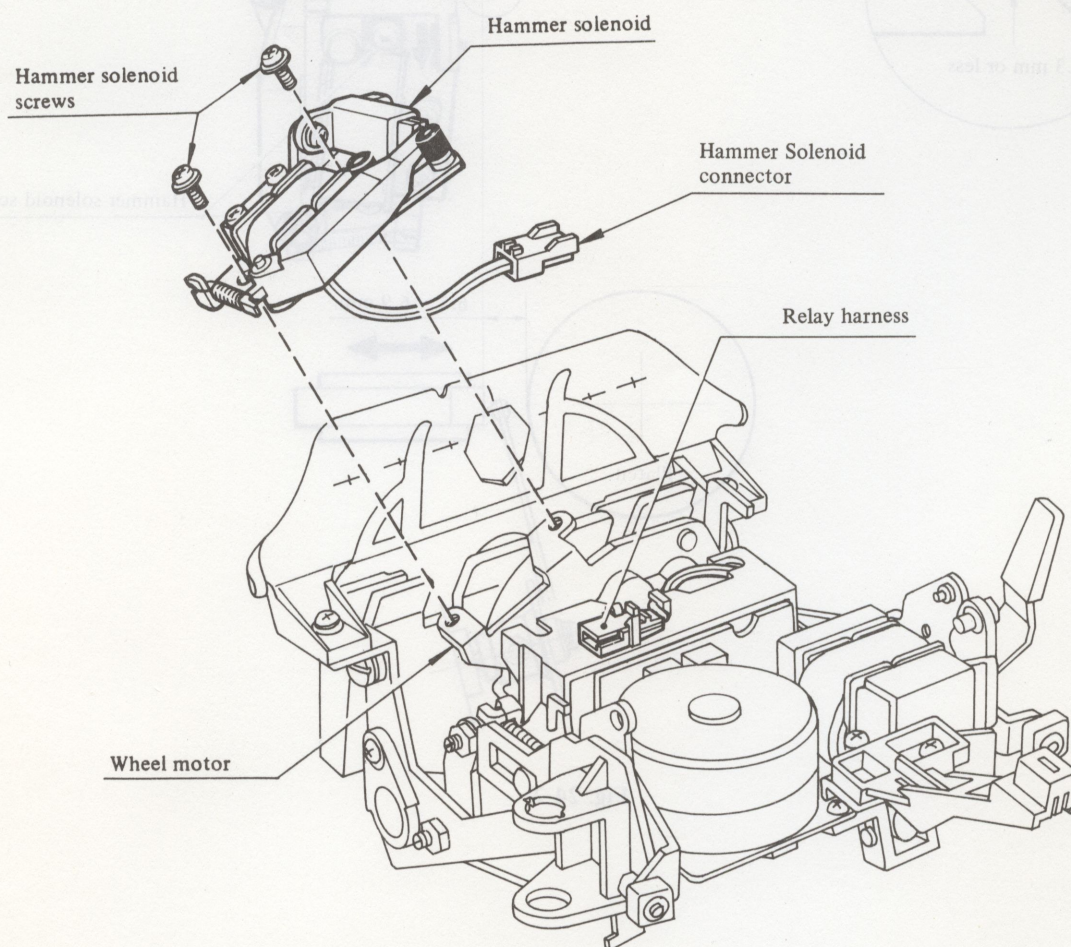


Fig. 24-1



### 24.3 Adjustment and Checks

#### (1) Hammer position

Make adjustment by hammer solenoid screws so that the clearance between the hammer and the platen surface is 6.5 ~ 6.9 mm.

Make adjustment in the state where the carrier fully approaches the platen by pushing the carrier adjust lever to the platen side.

Turn on the power and assure that character “.” is located at the top position of the print wheel, and also assure that the center of the detent of each print wheel is matched with the center of the V-groove in the hammer.

If the center of the V-groove in the hammer is deviated by 0.3 mm or more from the center of the detent of a print wheel, make adjustment by hammer solenoid screws so that the deviation is reduced to 0.3 mm or less. (Fig. 24-2)

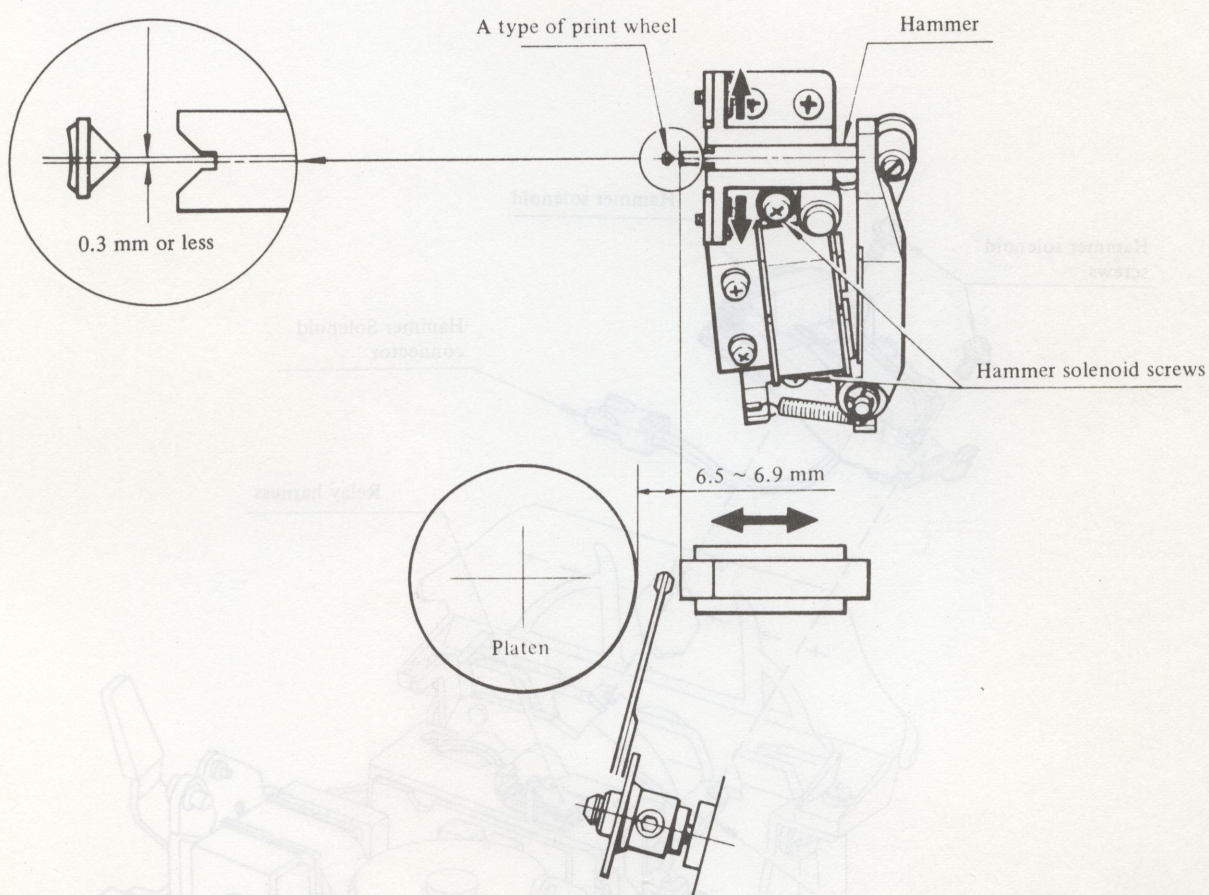


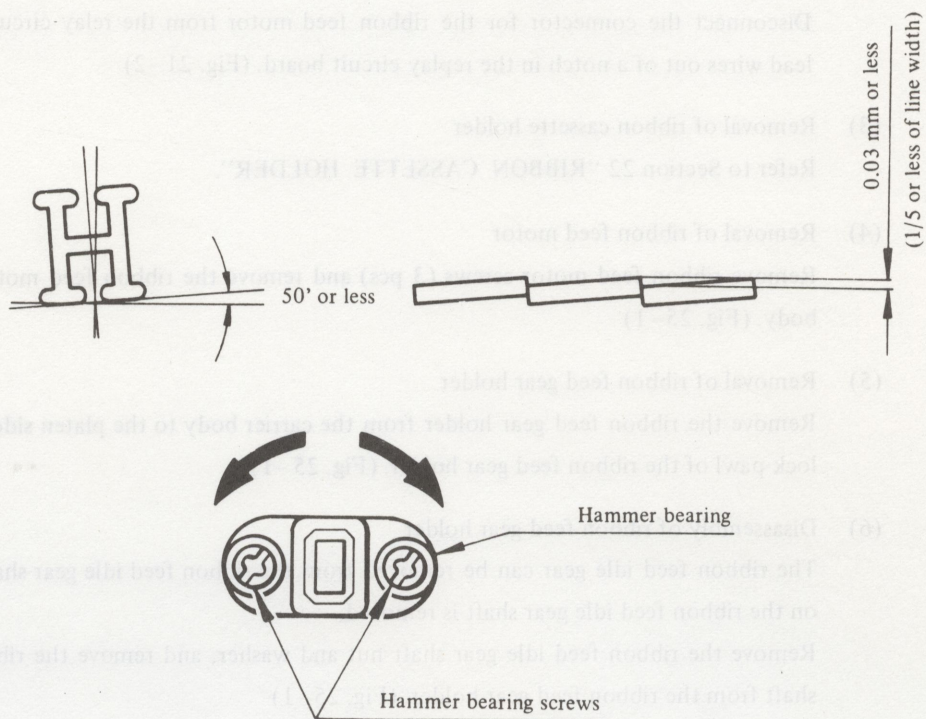
Fig. 24-2



## (2) Inclination of printed characters

Make adjustment by hammer bearing screws so that printed characters are free from inclination and that the continuation of under line “—” is straight (Fig. 24-3).

Characters' inclination should not exceed 50', and step difference in underlines should not exceed 0.03 mm.



## 24.4 Tools

Plus Driver (NO-1)



## 25. RIBBON FEED MOTOR

### 25.1 Removal

- (1) Removal of chassis unit

Refer to Section 11 "CHASSIS UNIT".

- (2) Disconnection of connector

Disconnect the connector for the ribbon feed motor from the relay circuit board, and move lead wires out of a notch in the replay circuit board. (Fig. 21-2)

- (3) Removal of ribbon cassette holder

Refer to Section 22 "RIBBON CASSETTE HOLDER".

- (4) Removal of ribbon feed motor

Remove ribbon feed motor screws (3 pcs) and remove the ribbon feed motor from the carrier body. (Fig. 25-1)

- (5) Removal of ribbon feed gear holder

Remove the ribbon feed gear holder from the carrier body to the platen side while pushing the lock pawl of the ribbon feed gear holder. (Fig. 25-1)

- (6) Disassembly of ribbon feed gear holder

The ribbon feed idle gear can be removed from the ribbon feed idle gear shaft when the E-ring on the ribbon feed idle gear shaft is removed.

Remove the ribbon feed idle gear shaft nut and washer, and remove the ribbon feed idle gear shaft from the ribbon feed gear holder. (Fig. 25-1)

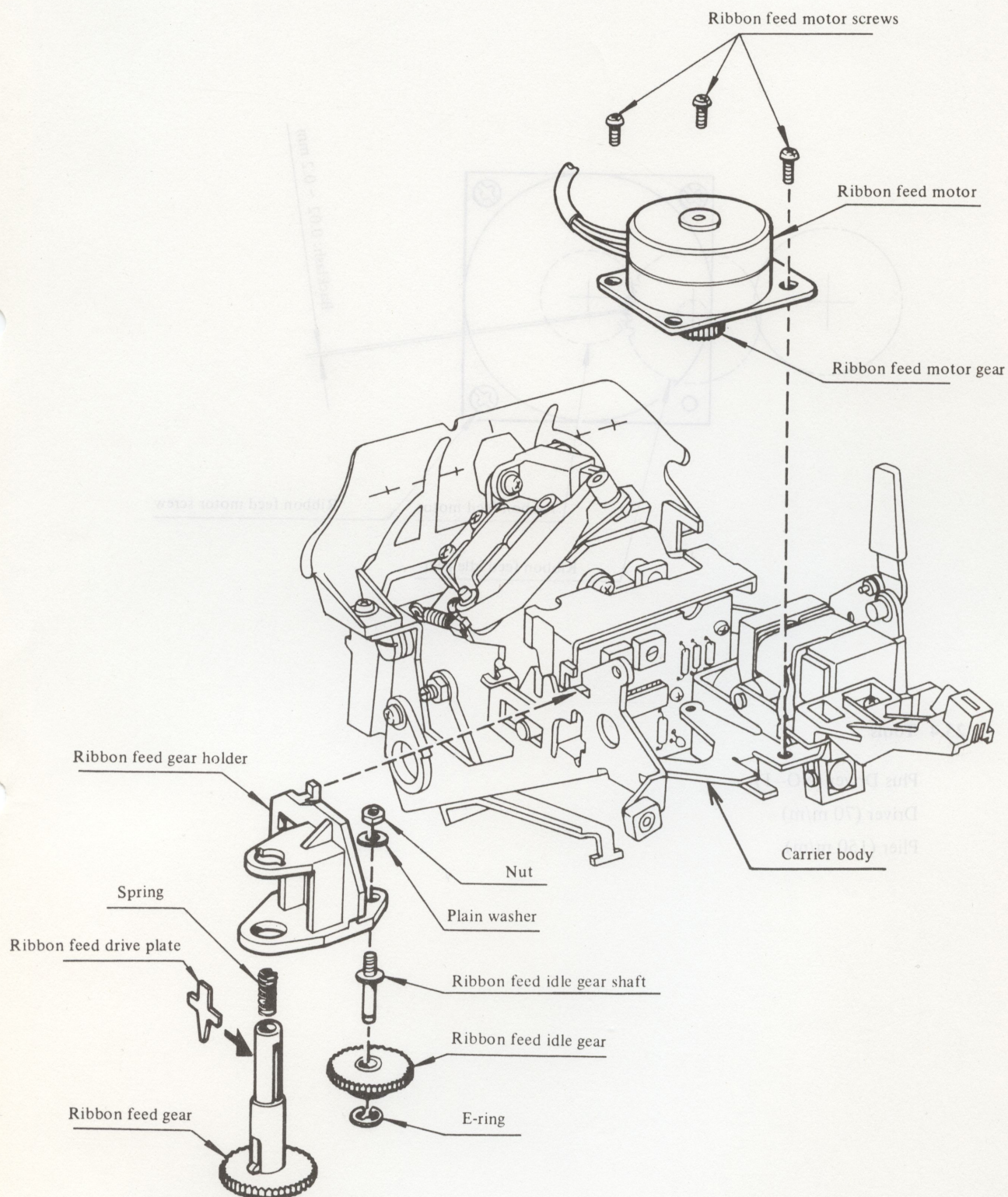
- (7) Disassembly of ribbon feed gear

Push the ribbon feed drive plate downward and take it out through the slit by the ribbon feed gear. The spring can be removed as a result. (Fig. 25-1)



## 25.2 Attachment

Attachment is reverse order of removal.

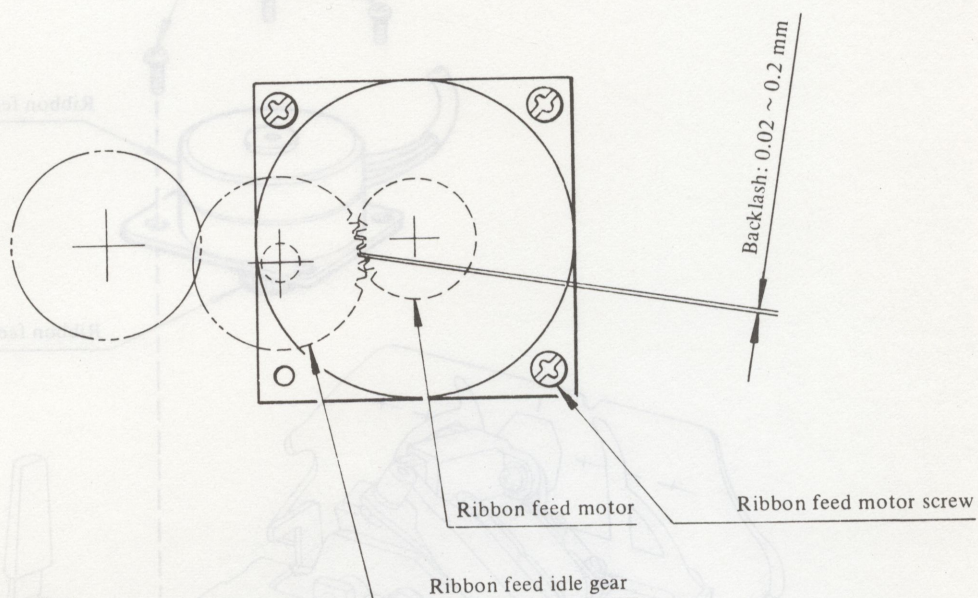




### 25.3 Adjustment and Checks

#### (1) Backlash of ribbon feed motor gear

Make adjustment by ribbon feed motor screws so that the backlash between ribbon feed motor gear and ribbon feed idle gear is 0.02 ~ 0.2 mm.



### 25.4 Tools

Plus Driver (NO-1)

Driver (70 m/m)

Plier (150 m/m)



## 26. RIBBON LIFT SOLENOID

### 26.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of relay circuit board  
Refer to Section 21 "RELAY CIRCUIT BOARD".
- (3) Removal of ribbon cassette holder  
Refer to Section 22 "RIBBON CASSETTE HOLDER".
- (4) Removal of ribbon feed motor  
Remove ribbon feed motor screws (3 pcs) and remove the ribbon feed motor from the carrier body. (Fig. 26-1)
- (5) Removal of correction solenoid  
Remove correction solenoid screws (2 pcs) and remove the correction solenoid from the carrier body. (Fig. 26-1)
- (6) Removal of ribbon lift crank A shaft  
Remove the spring for ribbon lift crank B, remove the E-ring from ribbon lift crank A shaft, and then extract ribbon lift crank A shaft out of the carrier body. (Fig. 26-1)
- (7) Removal of ribbon lift solenoid  
Remove ribbon lift solenoid screws (2 pcs) and remove the ribbon lift solenoid from the carrier body. (Fig. 26-1)
- (8) Removal of ribbon lift cranks A & B  
Remove ribbon lift cranks A & B from the carrier body. (Fig. 26-1)
- (9) Disassembly of ribbon lift cranks A & B
  - (a) Extract ribbon lift crank B shaft out of ribbon lift cranks A & B. (Fig. 26-2)
  - (b) Remove ribbon lift crank A iron core screw. Disassembly to ribbon lift crank A, ribbon lift crank A iron core and screw occurs as a result. (Fig. 26-2)
  - (c) Remove the E-ring from the correction plunger shaft and extract the correction plunger shaft out of ribbon lift crank B. (Fig. 26-2)
  - (d) Remove ribbon lift shaft nut. Disassembly to ribbon lift crank B, ribbon lift shaft, ribbon lift shaft washer, spring washer and nut occurs as a result. (Fig. 26-2)
  - (e) Remove the solenoid stopper rubber and snap ring from the plunger. (Fig. 26-2)



## 26.2 Attachment

Attach in the sequence opposite to that of removal. For attachment of the ribbon lift solenoid, put lead wires through the carrier body and then attach ribbon lift cranks A & B.

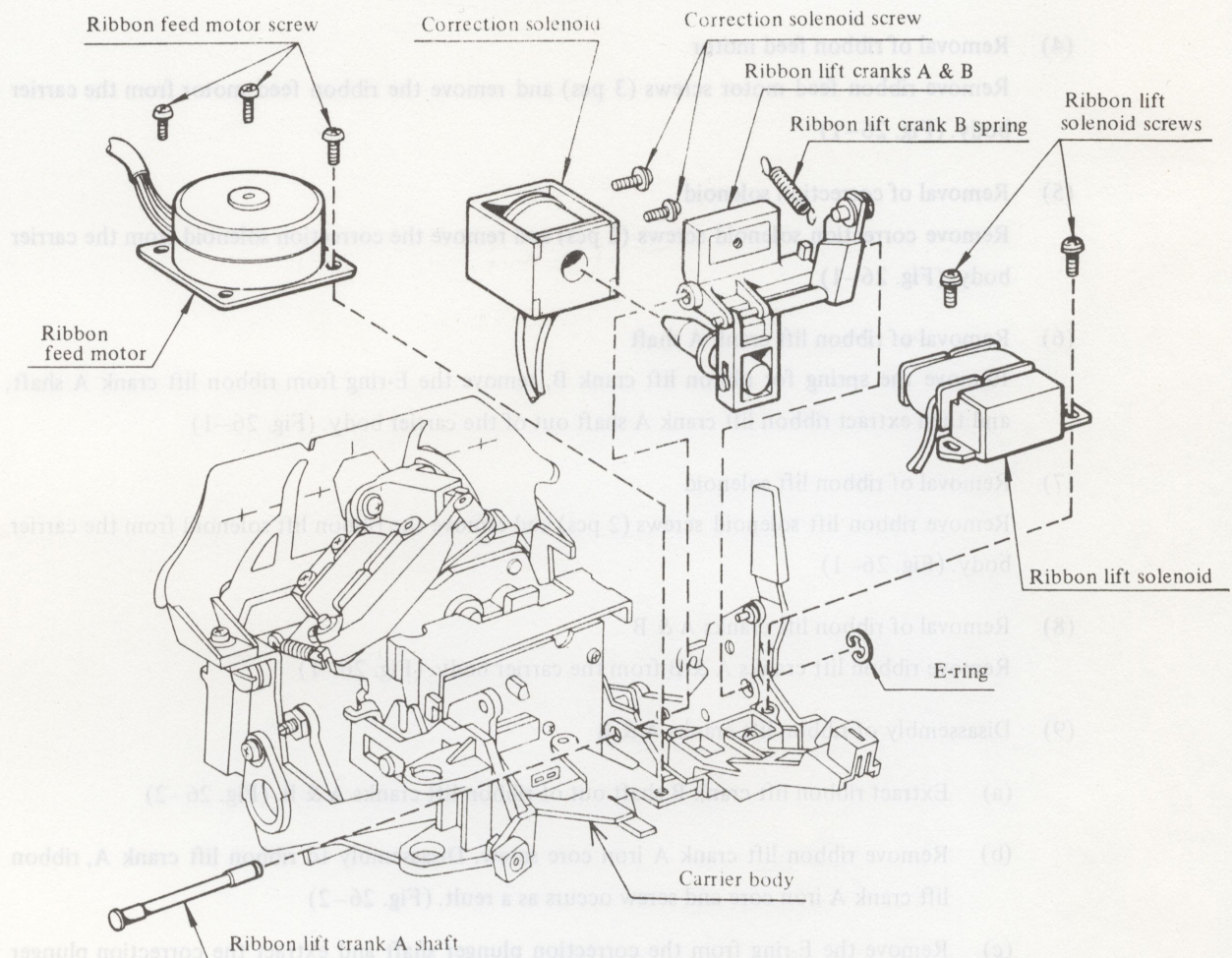


Fig. 26-1



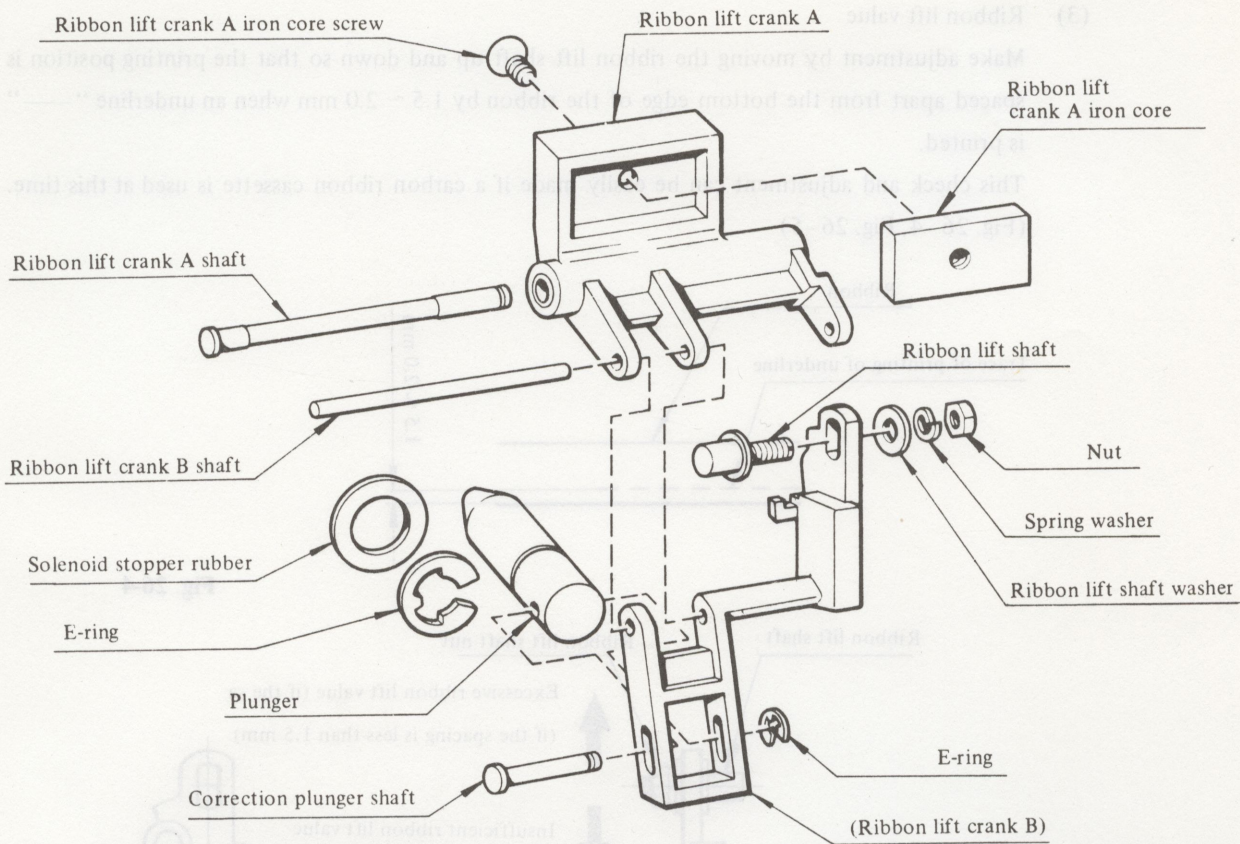


Fig. 26-2

26.3 Adjustment and Checks

- (1) Backlash of ribbon feed motor  
Refer to Section 25 "RIBBON FEED MOTOR".
- (2) Ribbon lift solenoid attachment position  
Make adjustment by ribbon lift solenoid screws so that ribbon lift crank A iron core and ribbon lift solenoid core are parallel and are free from clearance at the time when ribbon lift crank A is forced against the ribbon lift solenoid. (Fig. 26-3)

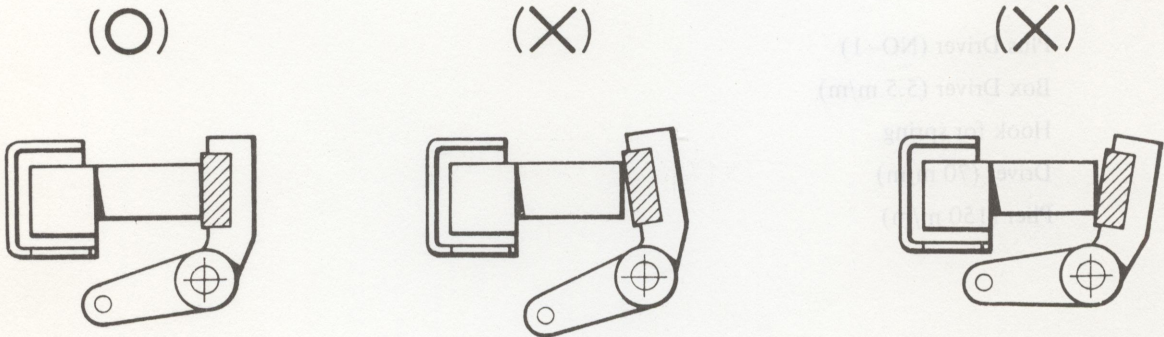


Fig. 26-3



## (3) Ribbon lift value

Make adjustment by moving the ribbon lift shaft up and down so that the printing position is spaced apart from the bottom edge of the ribbon by 1.5 ~ 2.0 mm when an underline “—” is printed.

This check and adjustment can be easily made if a carbon ribbon cassette is used at this time.

(Fig. 26-4, Fig. 26-5)

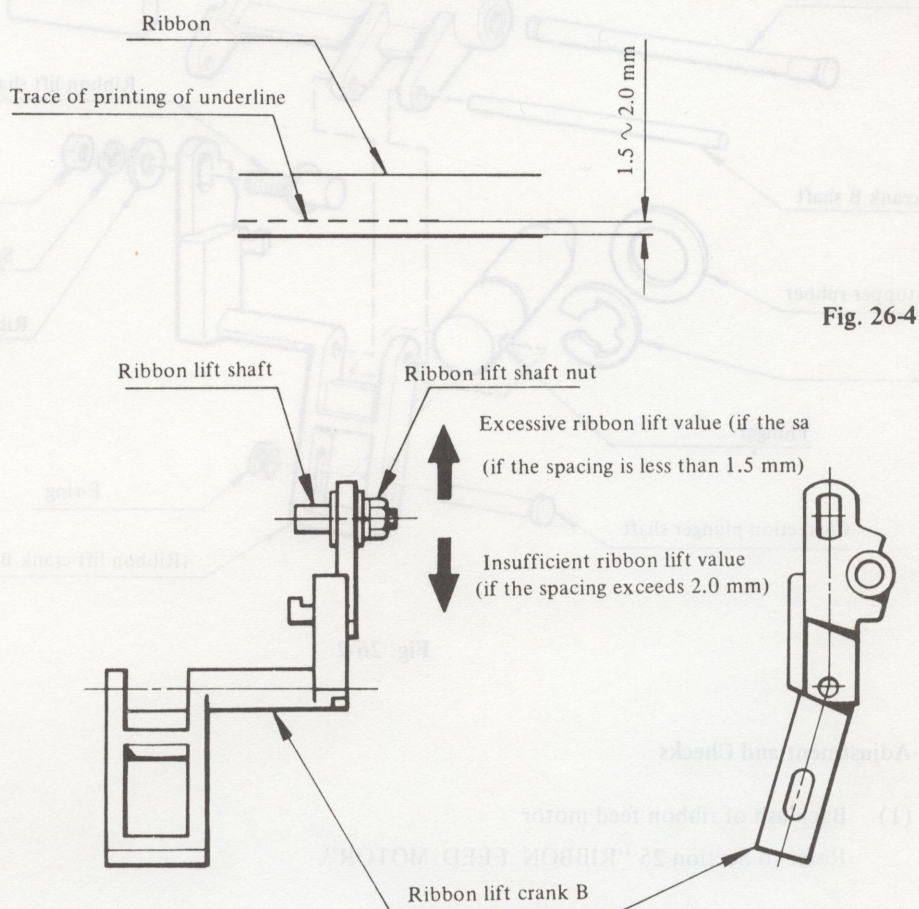


Fig. 26-4

## (4) Correction tape lift value

Refer to Section 27 “CORRECTION SOLENOID”.

## 26.4 Tools

- Plus Driver (NO-1)
- Box Driver (5.5 m/m)
- Hook for spring
- Driver (70 m/m)
- Plier (150 m/m)



## 27. CORRECTION SOLENOID

### 27.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of relay circuit board  
Refer to Section 21 "RELAY CIRCUIT BOARD".
- (3) Removal of correction solenoid  
Remove correction solenoid screws and remove the correction solenoid from the carrier body.  
(Fig. 27-1)

\* Refer to Section 26. "RIBBON LIFT SOLENOID" regarding removal of the plunger.

### 27.2 Attachment

Attachment is reverse order of removal.

### 27.3 Adjustment and Checks

- (1) Correction tape lift value  
Make adjustment by changing positions of the correction solenoid and correction stopper so that the correcting position is spaced apart from the bottom edge of the correction tape by 1.0 ~ 1.5 mm when correction of an underline is made.

This check and adjustment can be easily made if a lift-off tape is used. (Fig. 27-2, Fig. 27-3)

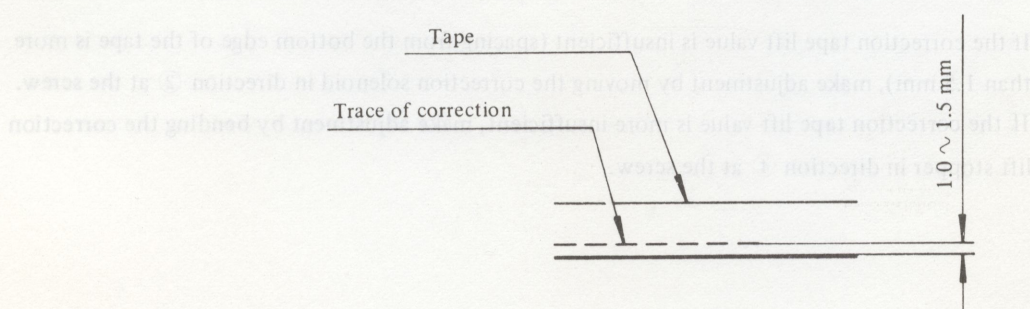


Fig. 27-2



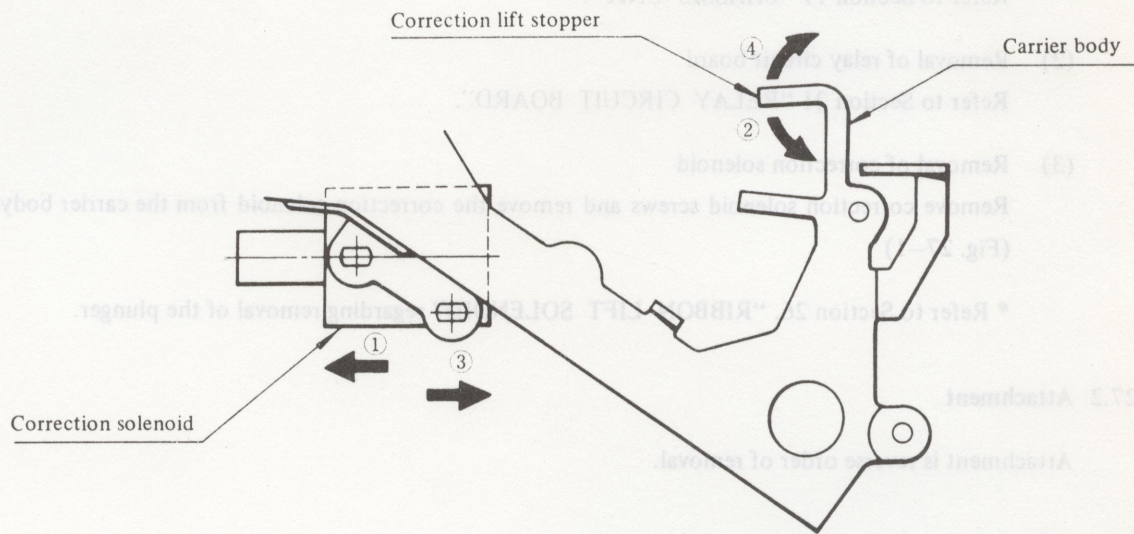


Fig. 27-3

- 1 If the correction tape lift value is excessive (spacing from bottom edge of the tape is less than 1 mm) make adjustment by moving the correction solenoid in direction ② at the screw.  
If the correction tape lift value is more excessive, make adjustment by bending the correction lift stopper in direction ② at the screw.
- 2 If the correction tape lift value is insufficient (spacing from the bottom edge of the tape is more than 1.5 mm), make adjustment by moving the correction solenoid in direction ② at the screw.  
If the correction tape lift value is more insufficient, make adjustment by bending the correction lift stopper in direction ④ at the screw.

#### 27.4 Tools

Plus Driver (NO-1)

Plier (150 mm)



Correction Solenoid

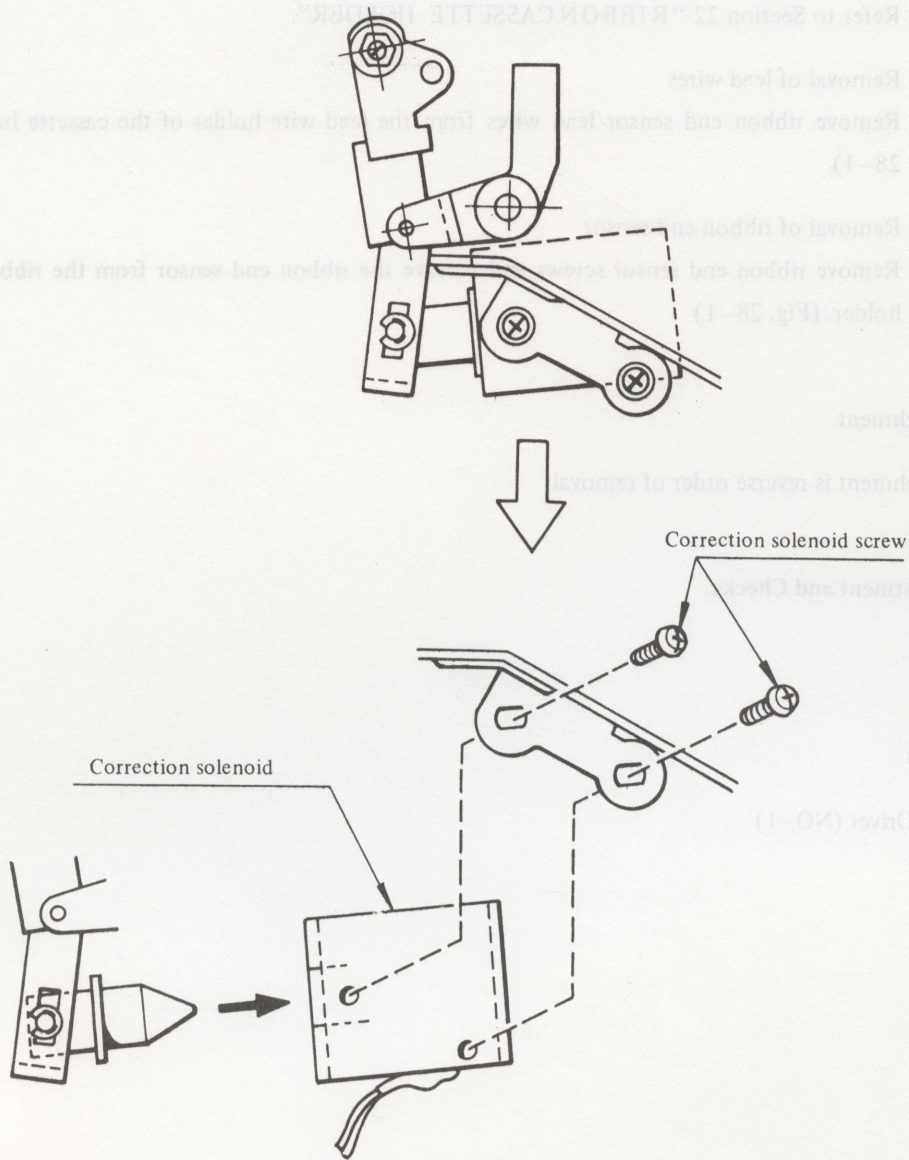


Fig. 27-1



## 28. RIBBON END SENSOR

### 28.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT"
- (2) Removal of ribbon cassette holder  
Refer to Section 22 "RIBBON CASSETTE HOLDER".
- (3) Removal of lead wires  
Remove ribbon end sensor lead wires from the lead wire holder of the cassette holder. (Fig. 28-1)
- (4) Removal of ribbon end sensor  
Remove ribbon end sensor screws and remove the ribbon end sensor from the ribbon cassette holder. (Fig. 28-1)

### 28.2 Attachment

Attachment is reverse order of removal.

### 28.3 Adjustment and Checks

None.

### 28.4 Tools

Plus Driver (NO-1)



Ribbon end sensor

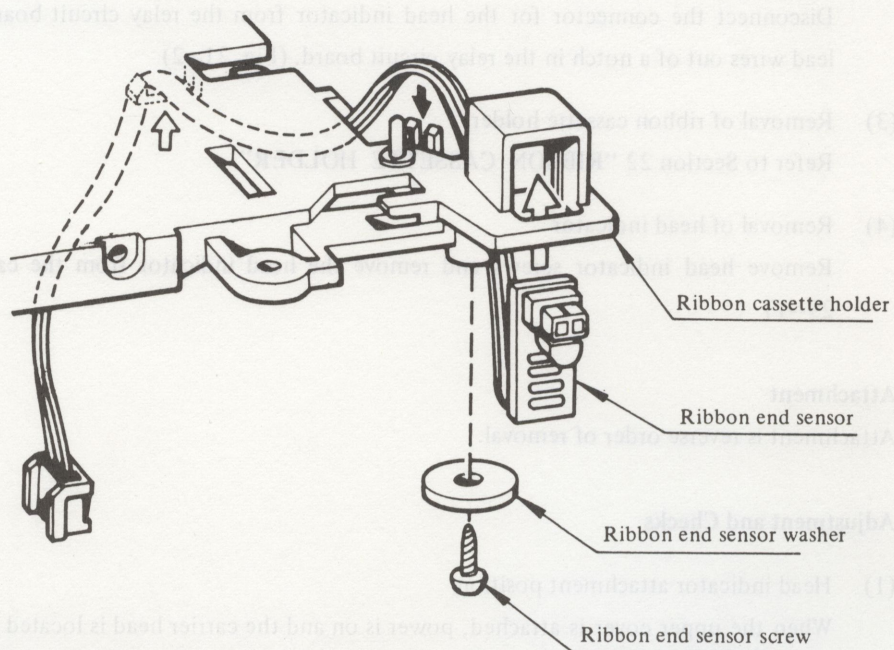


Fig. 28-1



## 29. HEAD INDICATOR

### 29.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Disconnection of connector  
Disconnect the connector for the head indicator from the relay circuit board, and move the lead wires out of a notch in the relay circuit board. (Fig. 21-2)
- (3) Removal of ribbon cassette holder  
Refer to Section 22 "RIBBON CASSETTE HOLDER".
- (4) Removal of head indicator  
Remove head indicator screws and remove the head indicator from the carrier body. (Fig. 29-1)

### 29.2 Attachment

Attachment is reverse order of removal.

### 29.3 Adjustment and Checks

- (1) Head indicator attachment position  
When the upper cover is attached, power is on and the carrier head is located at zero point, the LED in the head indicator should be matched with "0" graduation in the margin scale base.  
If a deviation that is beyond  $1/4$  of pica pitch is observed, make adjustment by the screw so that the deviation is reduced to  $1/4$  of pica pitch. (Fig. 29-1, Fig. 29-2)

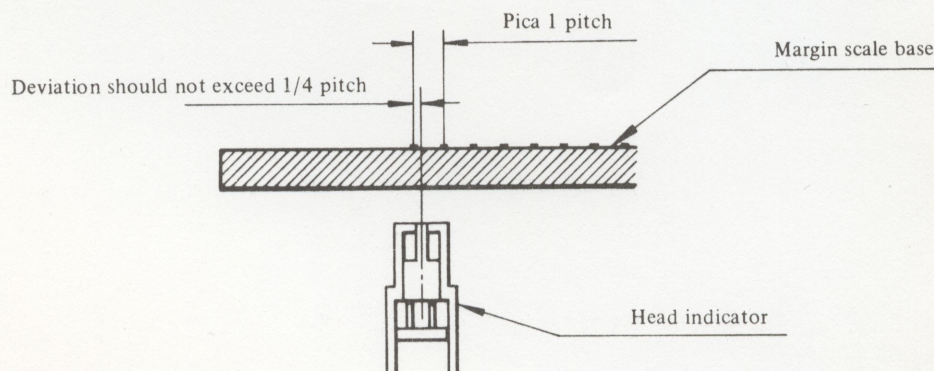
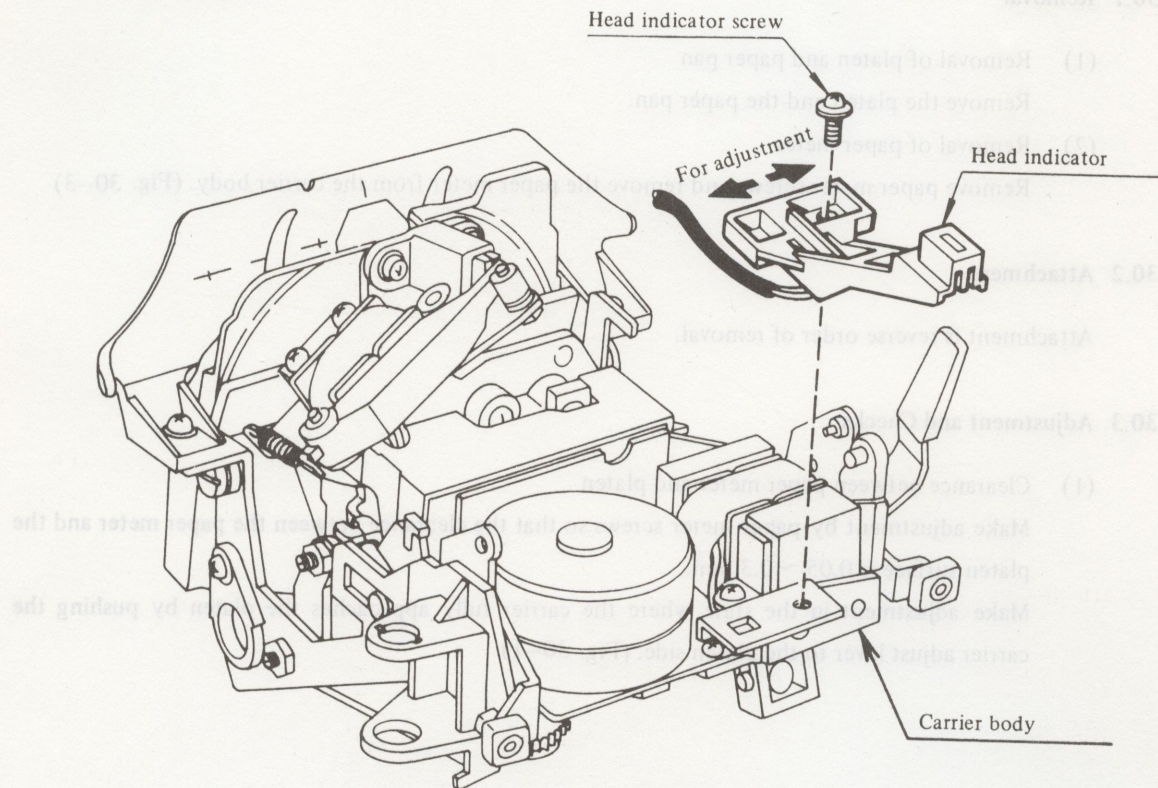


Fig. 29-2



Head indicator



## 29.4 Tools

Plus Driver (NO-1)



### 30. PAPER METER

#### 30.1 Removal

- (1) Removal of platen and paper pan  
Remove the platen and the paper pan.
- (2) Removal of paper meter  
Remove paper meter screws and remove the paper meter from the carrier body. (Fig. 30-3)

#### 30.2 Attachment

Attachment is reverse order of removal.

#### 30.3 Adjustment and Checks

- (1) Clearance between paper meter and platen  
Make adjustment by paper meter screws so that the clearance between the paper meter and the platen surface is 0.05 ~ 0.3 mm.  
Make adjustment in the state where the carrier fully approaches the platen by pushing the carrier adjust lever to the platen side. (Fig. 30-1)

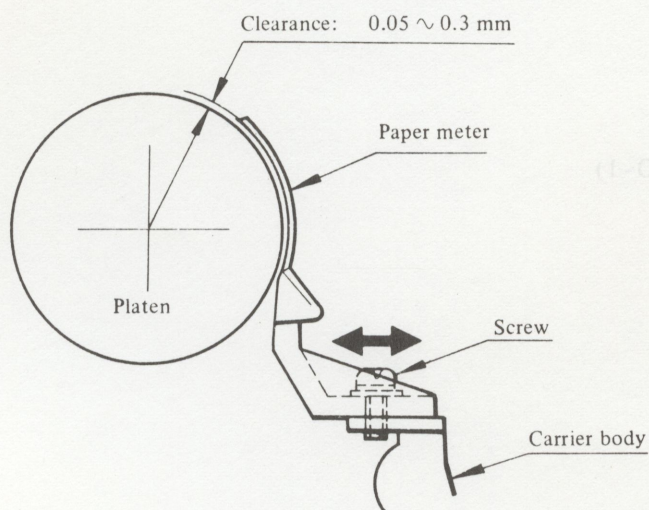


Fig. 30-1



## (2) Vertical and horizontal positions of paper meter

Print character " I " and assure that the deviation in the vertical direction does not exceed one printing line (0.16 mm).

As adjustment in vertical direction cannot be made, check the carrier guide position (refer to Section 20 "CARRIER UNIT") if this deviation is excessive.

Print character " I " again and assure that the deviation in the horizontal direction does not exceed one half (0.08 mm) of one printing line. If the deviation exceeds this value, make adjustment with paper meter screws loosened. (Fig. 30-2)

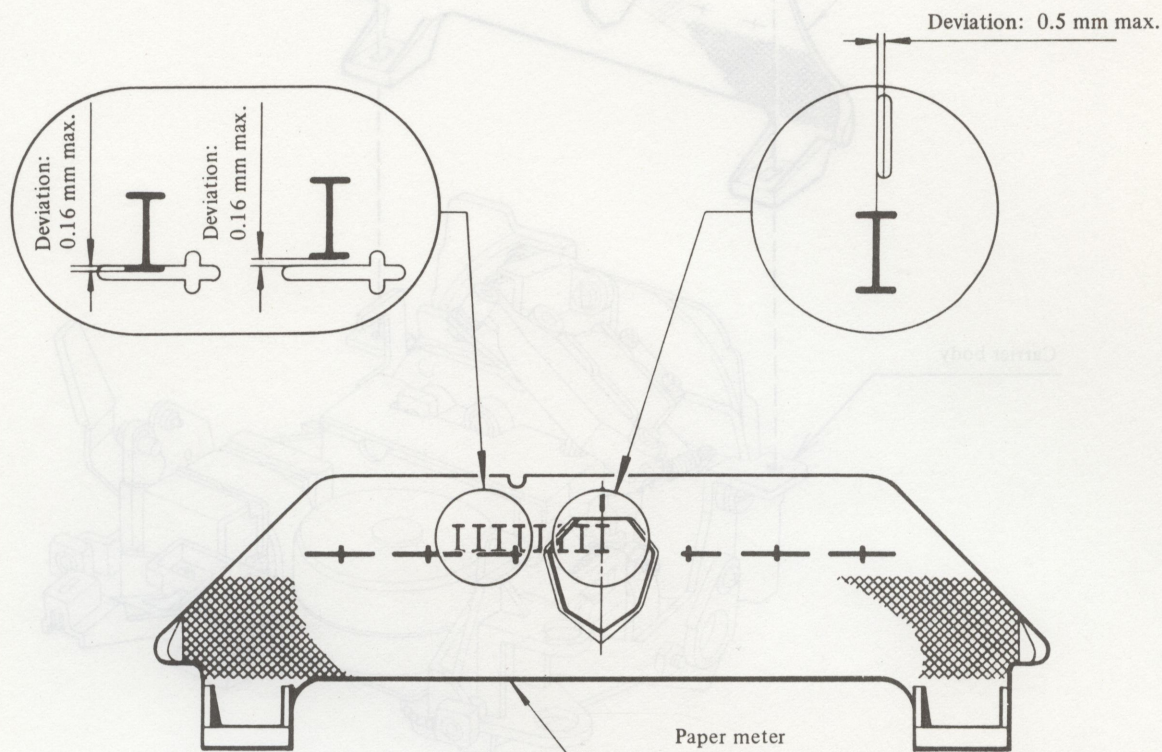


Fig. 30-2

## 30.4 Tools

Plus Driver (NO-1)



Paper meter

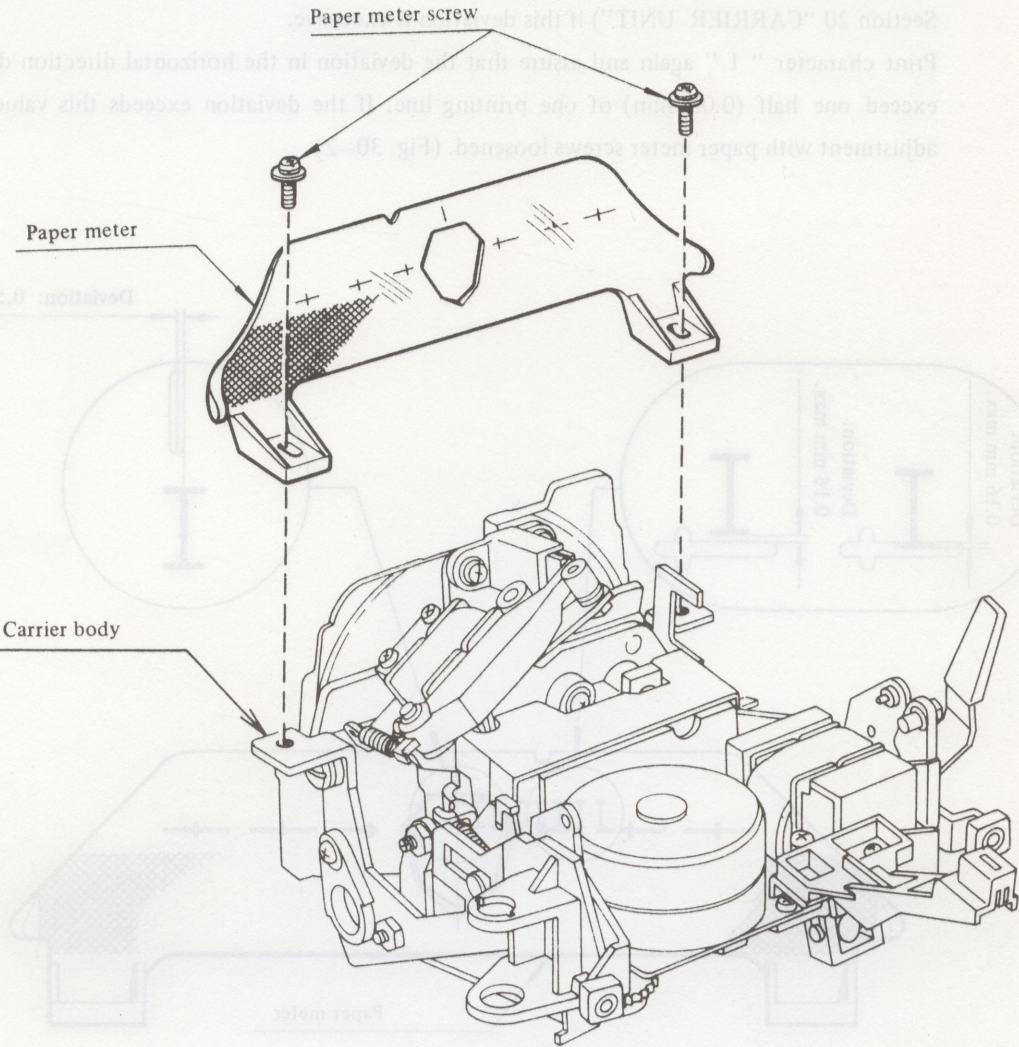


Fig. 30-3



## 31. PW CASSETTE GUIDE

### 31.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of carrier unit  
Refer to Section 20 "CARRIER UNIT".
- (3) Removal of paper meter  
Refer to Section 30 "PAPER METER".
- (4) Removal of PW cassette guide  
Remove PW cassette guide screws (3 pcs) and remove the PW cassette guide from the carrier body. (Fig. 31-1)
- (5) Removal of ribbon guide  
Extract the ribbon guide while raising pawls of the PW cassette guide. (Fig. 31-1)

### 31.2 Attachment

Attachment is reverse order of removal.

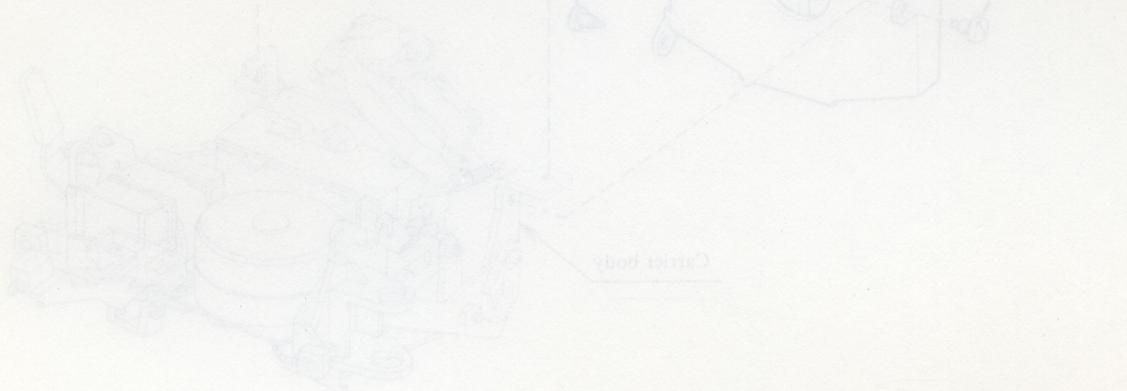


Fig. 31-1

### 31.3 Adjustment and Checks

- (1) Position of PW cassette guide  
Make adjustment by the PW cassette guide right lower screw so that the clearance between the print wheel and the PW cassette is equal and that the clearance between the paper meter and the ribbon guide is 0.3 ~ 0.7 mm. (Fig. 31-2)



## PW cassette guide

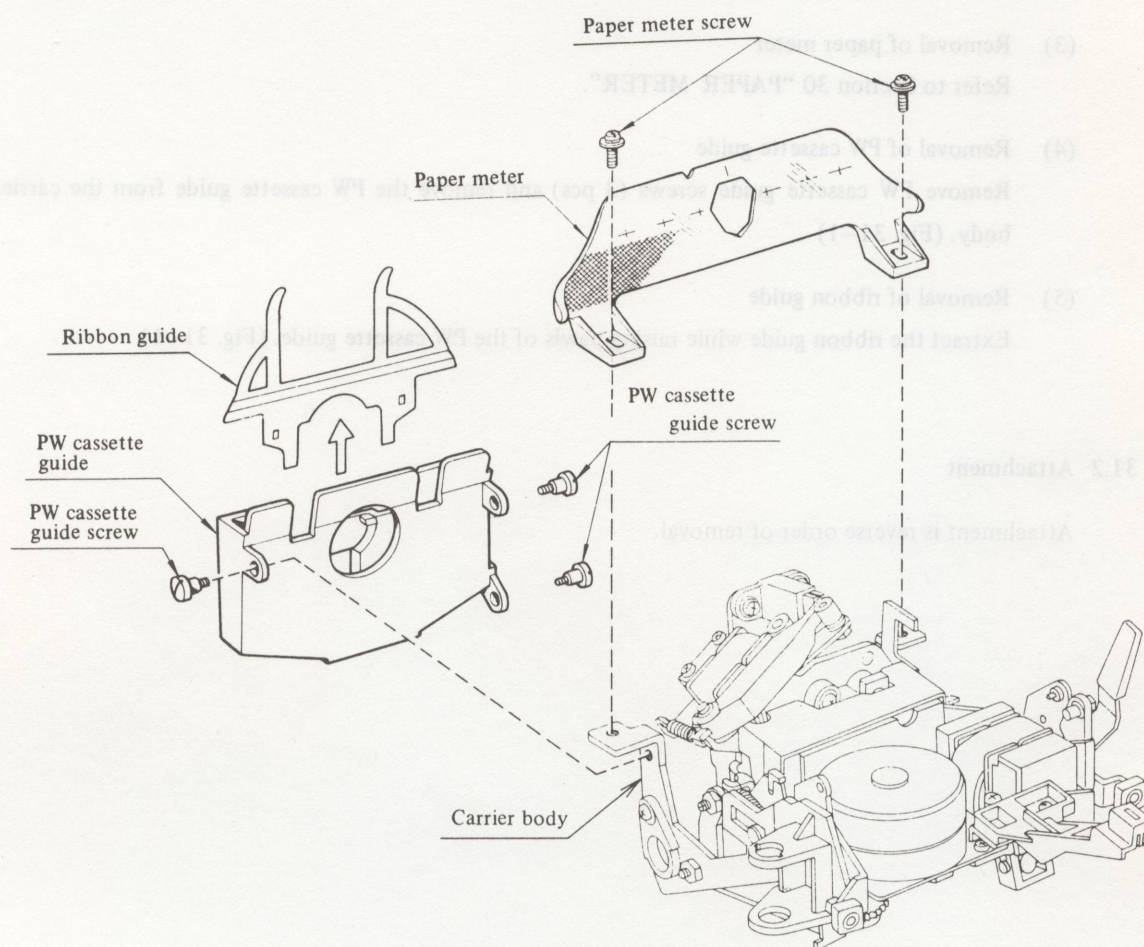


Fig. 31-1

## 31.3 Adjustment and Checks

## (1) Position of PW cassette guide

Make adjustment by the PW cassette guide right lower screw so that the clearance between the print wheel and the PW cassette is equal and that the clearance between the paper meter and the ribbon guide is 0.3 ~ 0.7 mm. (Fig. 31-2)



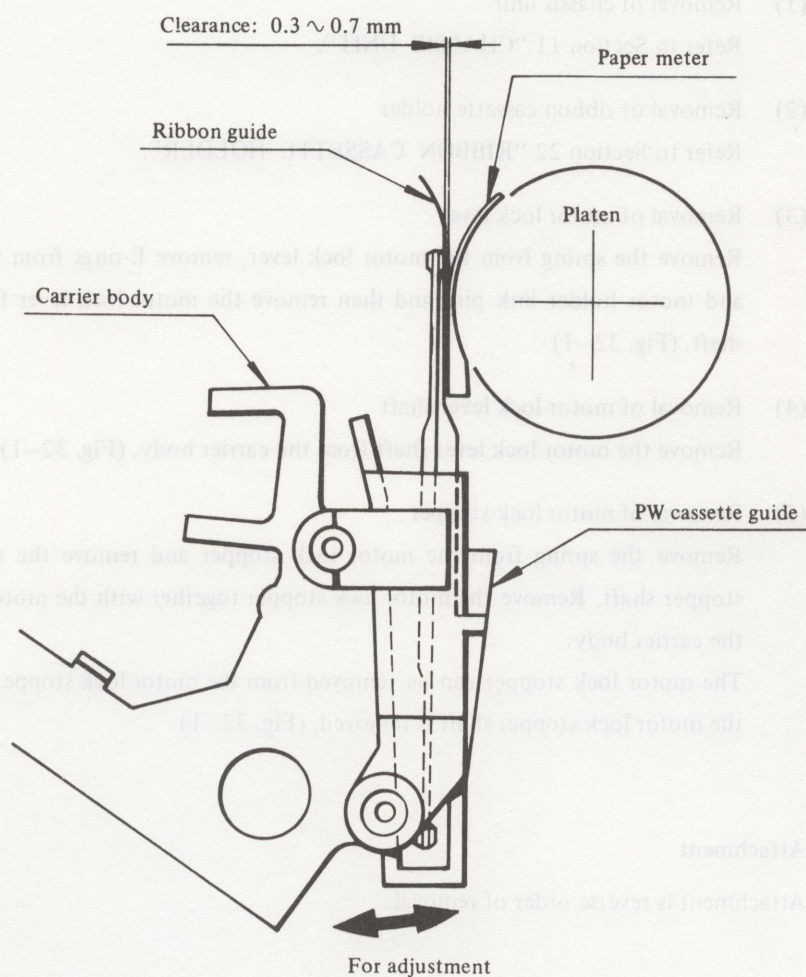


Fig. 31-2

### 31.4 Tools

Plus Driver (NO-1)

Driver (70 m/m)



## 32. MOTOR LOCK LEVER & MOTOR LOCK STOPPER

### 32.1 Removal

- (1) Removal of chassis unit  
Refer to Section 11 "CHASSIS UNIT".
- (2) Removal of ribbon cassette holder  
Refer to Section 22 "RIBBON CASSETTE HOLDER".
- (3) Removal of motor lock lever  
Remove the spring from the motor lock lever, remove E-rings from the motor lock lever shaft and motor holder link pin, and then remove the motor lock lever from the motor lock lever shaft. (Fig. 32-1)
- (4) Removal of motor lock lever shaft  
Remove the motor lock lever shaft from the carrier body. (Fig. 32-1)
- (5) Removal of motor lock stopper  
Remove the spring from the motor lock stopper and remove the nut from the motor lock stopper shaft. Remove the motor lock stopper together with the motor lock stopper shaft from the carrier body.  
The motor lock stopper can be removed from the motor lock stopper shaft when the E-ring on the motor lock stopper shaft is removed. (Fig. 32-1)

### 32.2 Attachment

Attachment is reverse order of removal.

### 32.3 Adjustment and Checks

- (1) Position of motor lock stopper  
Make adjustment so that a suitable clearance is provided between the PW cassette guide and the print wheel. Refer to Section 23 "WHEEL MOTOR" for details. (Fig. 23-2)



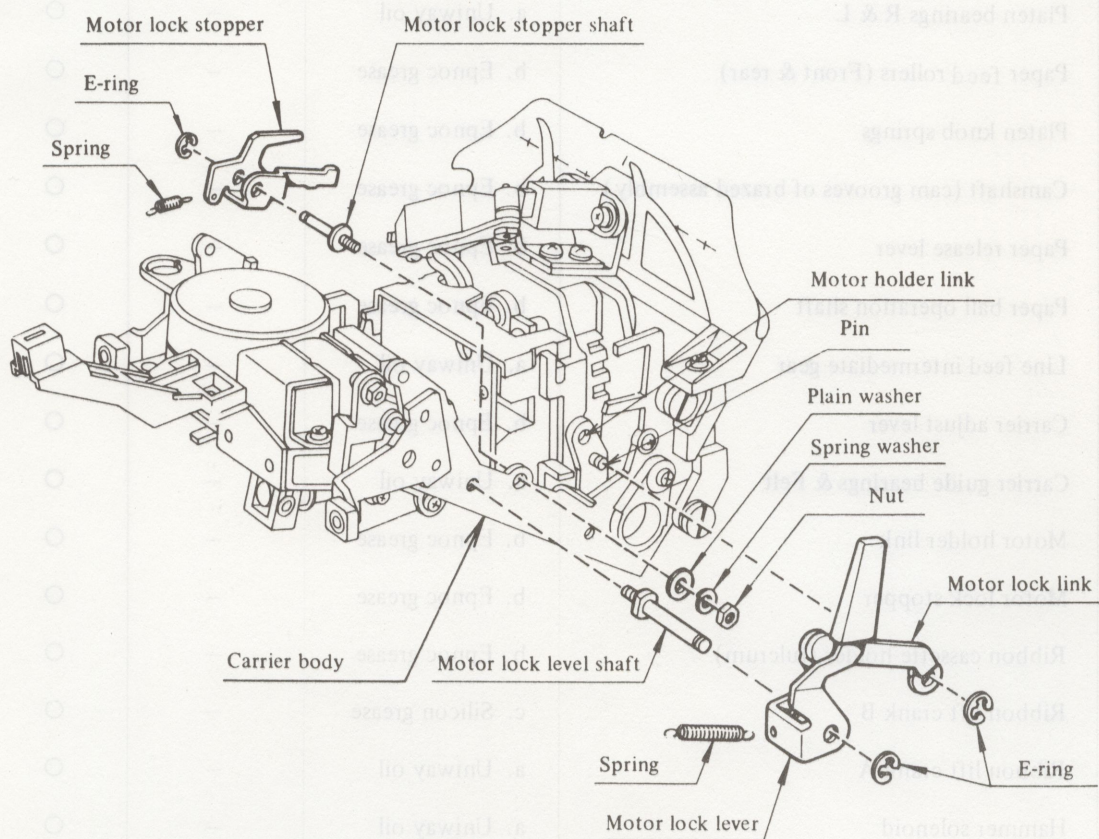


Fig. 32-1

### 32.4 Tools

Spanner (5.5 x 7 m/m)

Box Driver (6.0 m/m)

Hook for spring

Driver (70 m/m)

Plier (150 m/m)



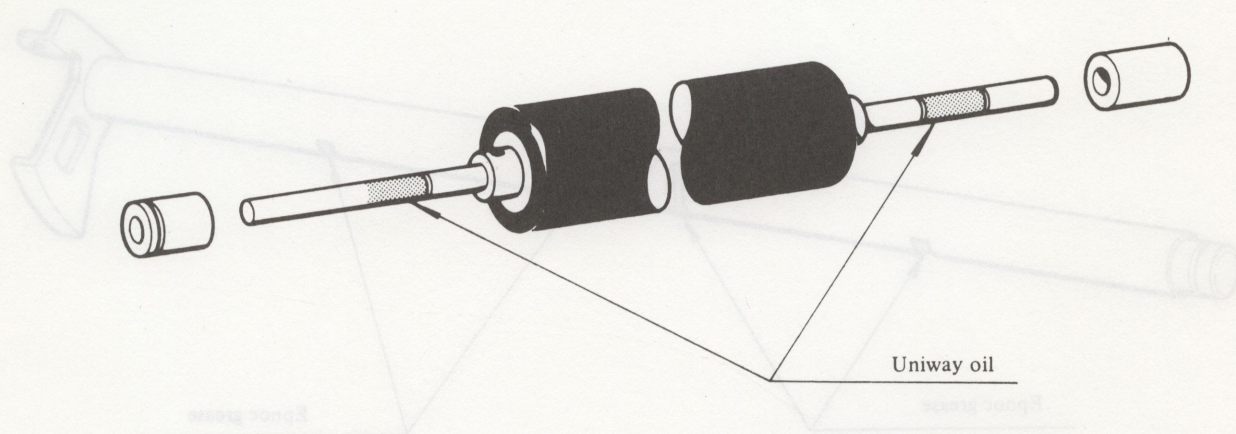
## 2. LUBRICATION STANDARD

| No. | Lubrication points                        | Type of lubricate | Lubrication intervals |                |
|-----|-------------------------------------------|-------------------|-----------------------|----------------|
|     |                                           |                   | Once a year           | On replacement |
| 1   | Platen bearings R & L                     | a. Uniway oil     | —                     | ○              |
| 2   | Paper feed rollers (Front & rear)         | b. Epnoc grease   | —                     | ○              |
| 3   | Platen knob springs                       | b. Epnoc grease   | —                     | ○              |
| 4   | Camshaft (cam grooves of brazed assembly) | b. Epnoc grease   | —                     | ○              |
| 5   | Paper release lever                       | b. Epnoc grease   | —                     | ○              |
| 6   | Paper bail operation shaft                | b. Epnoc grease   | —                     | ○              |
| 7   | Line feed intermediate gear               | a. Uniway oil     | —                     | ○              |
| 8   | Carrier adjust lever                      | b. Epnoc grease   | —                     | ○              |
| 9   | Carrier guide bearings & Felt             | a. Uniway oil     | —                     | ○              |
| 10  | Motor holder link                         | b. Epnoc grease   | —                     | ○              |
| 11  | Motor lock stopper                        | b. Epnoc grease   | —                     | ○              |
| 12  | Ribbon cassette holder (fulcrum)          | b. Epnoc grease   | —                     | ○              |
| 13  | Ribbon lift crank B                       | c. Silicon grease | —                     | ○              |
| 14  | Ribbon lift crank A                       | a. Uniway oil     | —                     | ○              |
| 15  | Hammer solenoid                           | a. Uniway oil     | —                     | ○              |
| 16  | Driving pulley                            | b. Epnoc grease   | —                     | ○              |
| 17  | Wheel motor support shaft & Carrier body  | b. Epnoc grease   | —                     | ○              |

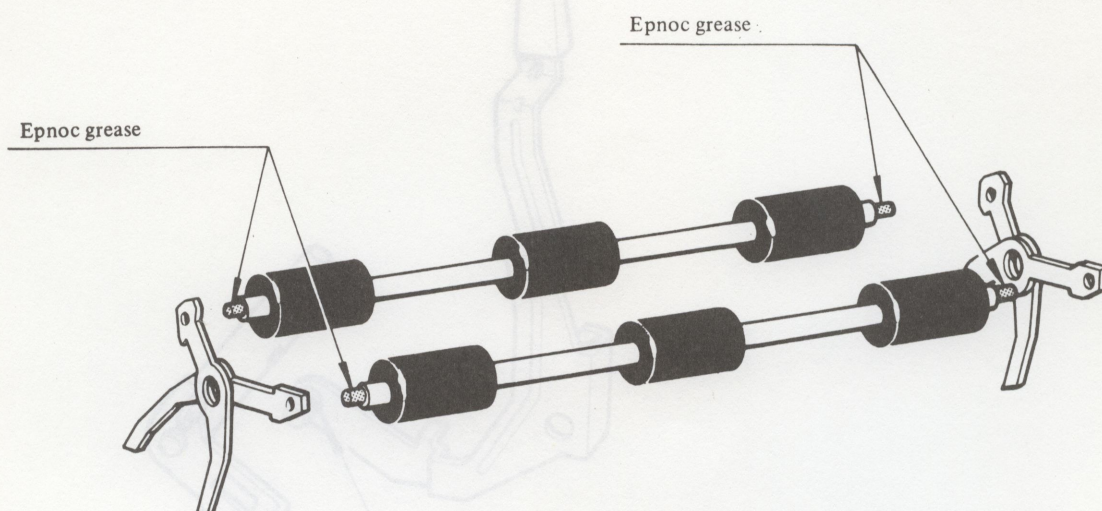
Note : Articles to be lubricated once a year will be instructed after endurance test and evaluation.



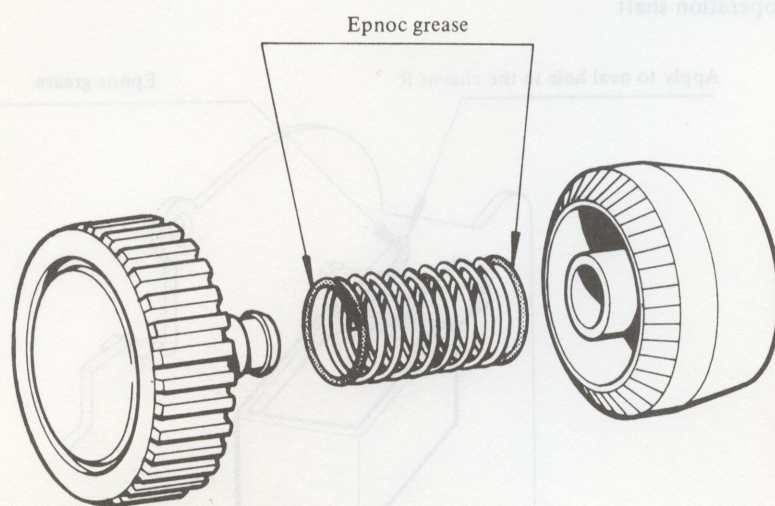
## 1. Platen bearings R &amp; L



## 2. Paper feed rollers front and rear

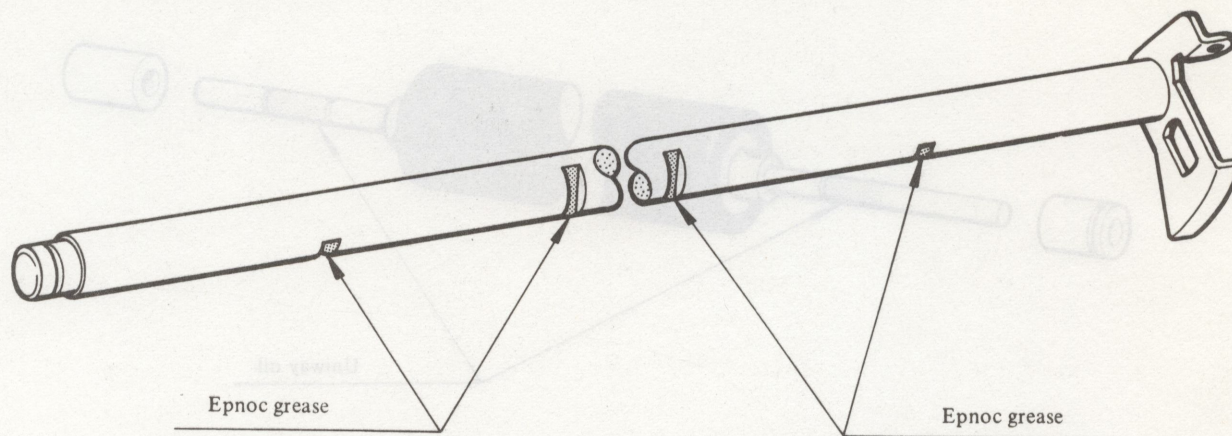


## 3. Platen knob springs

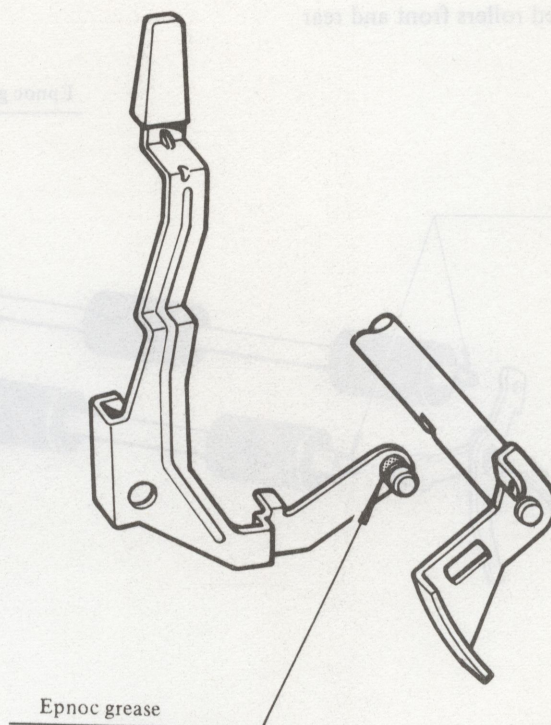




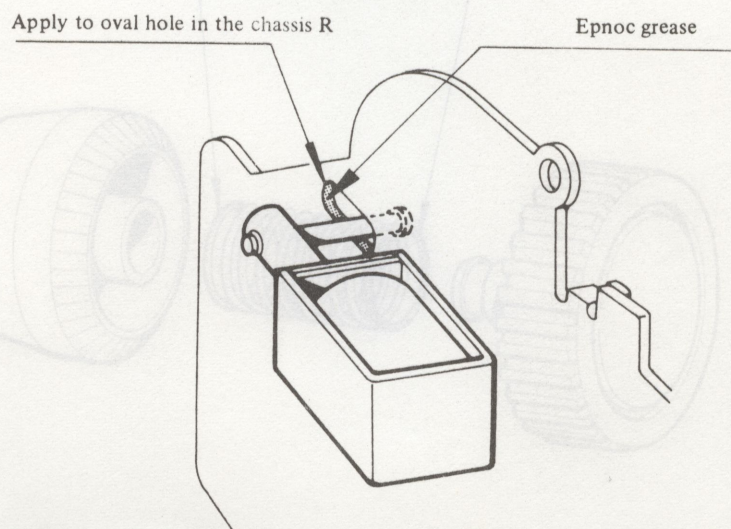
4. Cam shaft Unit (Cam grooves)



5. Paper release lever

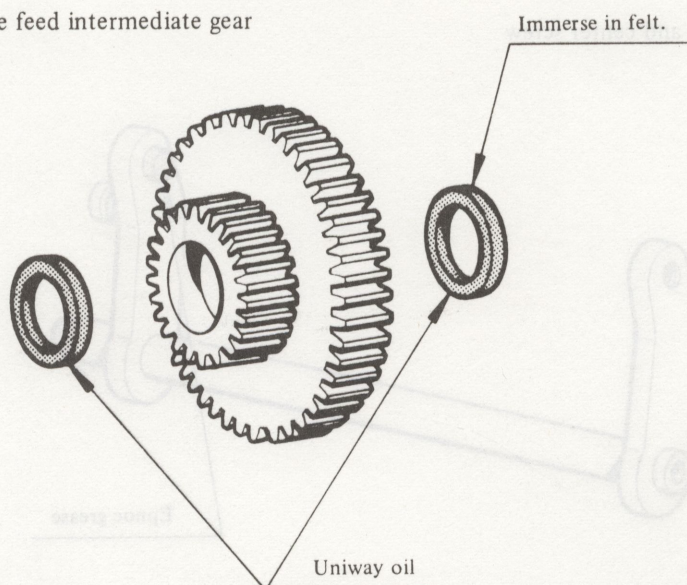


6. Paper bail operation shaft

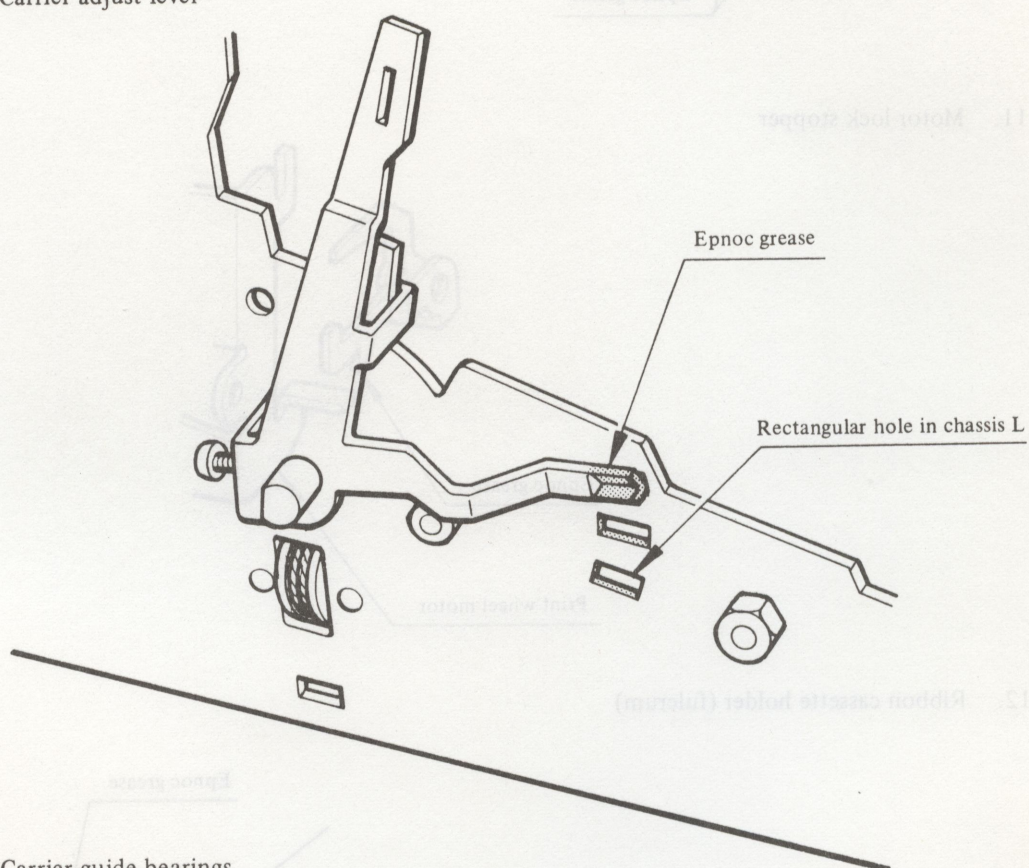




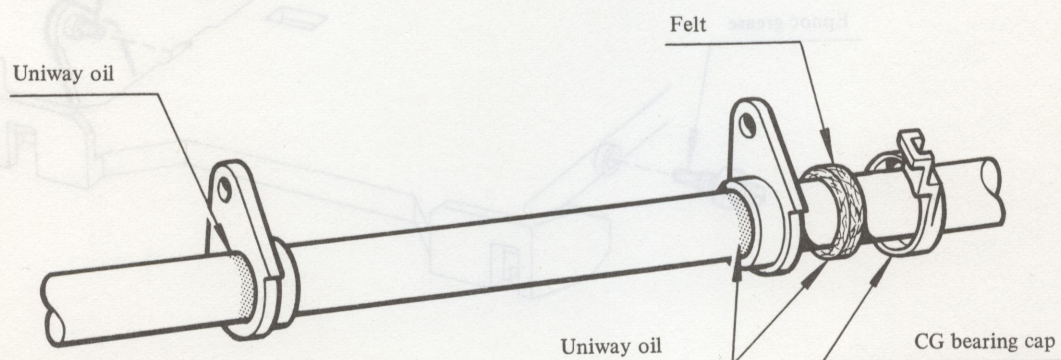
## 7. Line feed intermediate gear



## 8. Carrier adjust lever

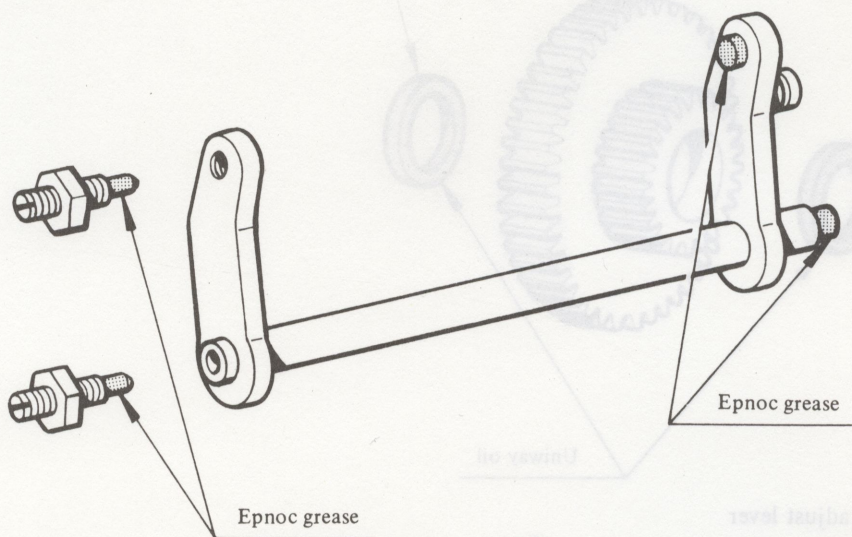


## 9. Carrier guide bearings

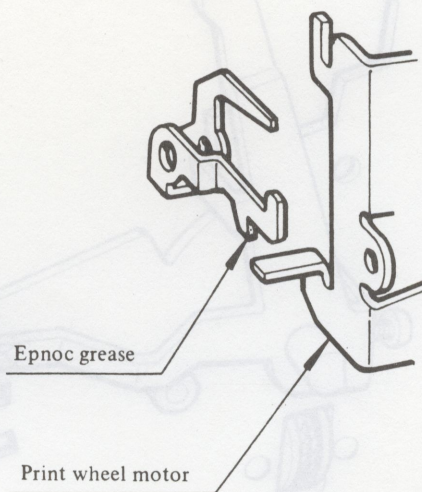




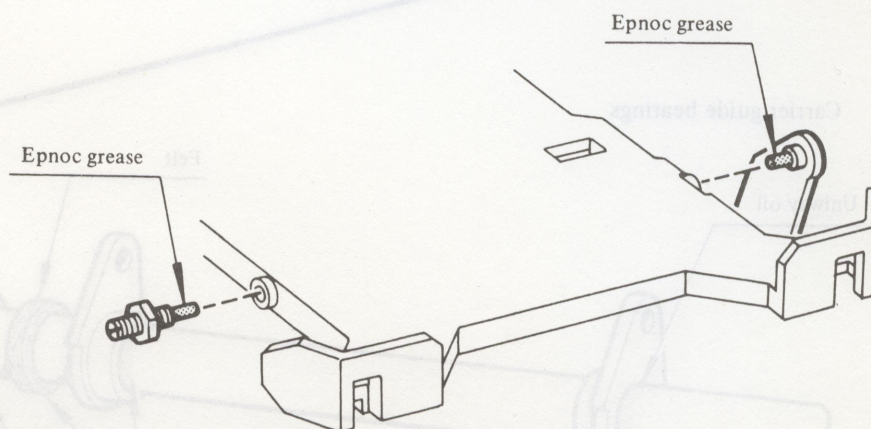
10. Motor holder link unit and center screw



11. Motor lock stopper

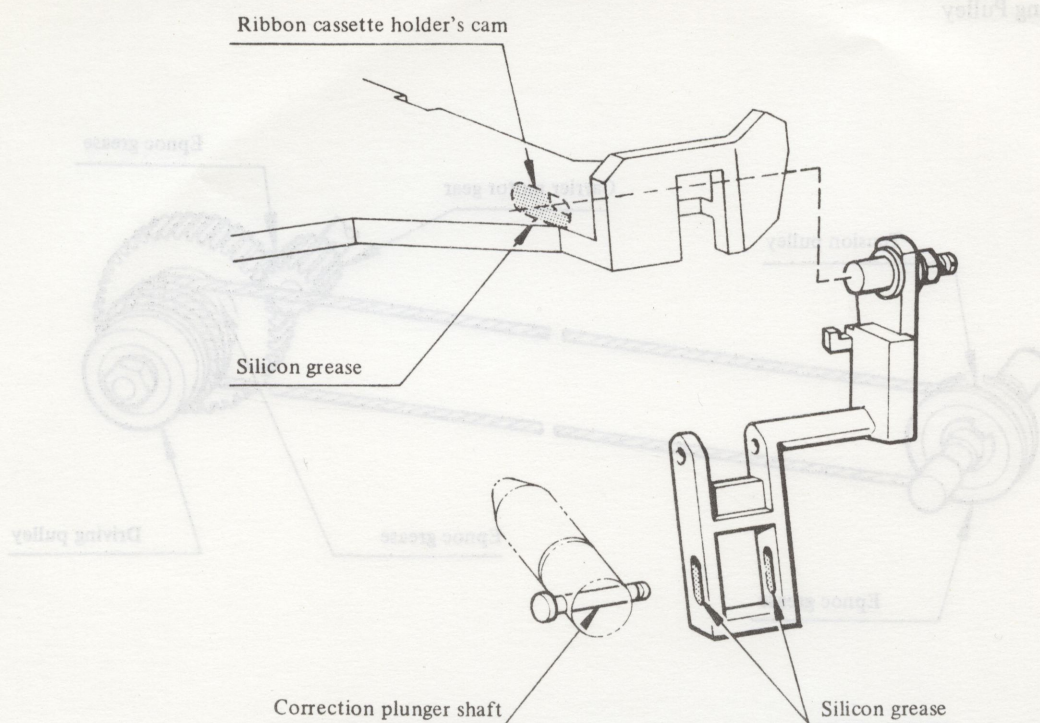


12. Ribbon cassette holder (fulcrum)

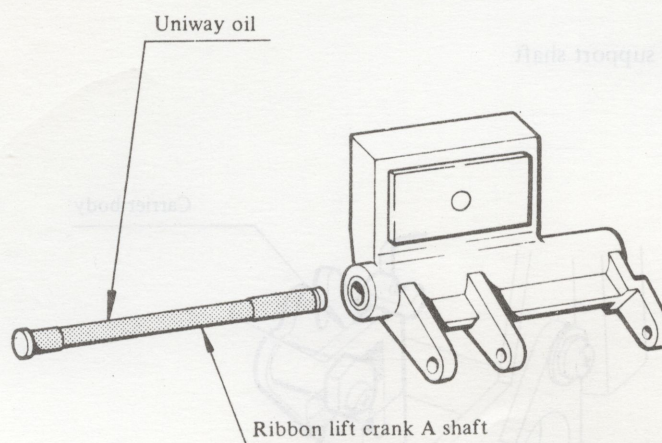




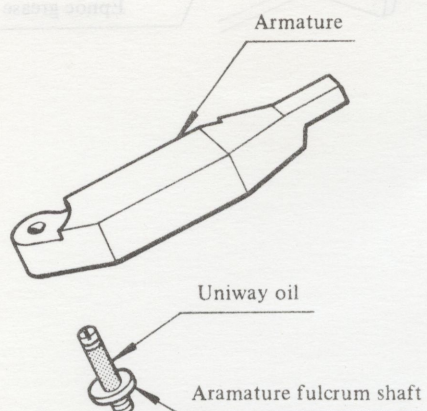
13. Ribbon lift crank B . . . . Ribbon cassette holder's cam and correction plunger shaft



14. Ribbon lift crank A

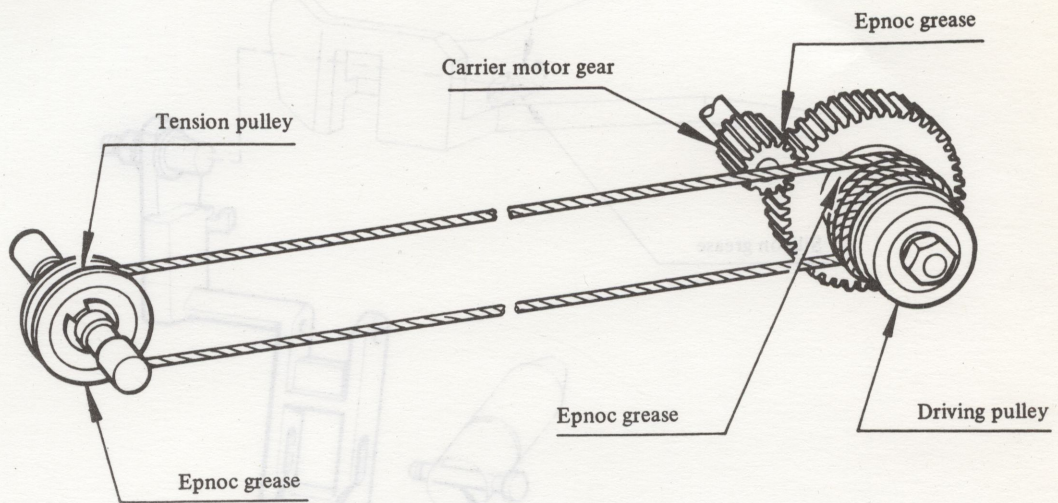


15. Hammer solenoid





## 16. Driving Pulley



## 17. Wheel motor support shaft

